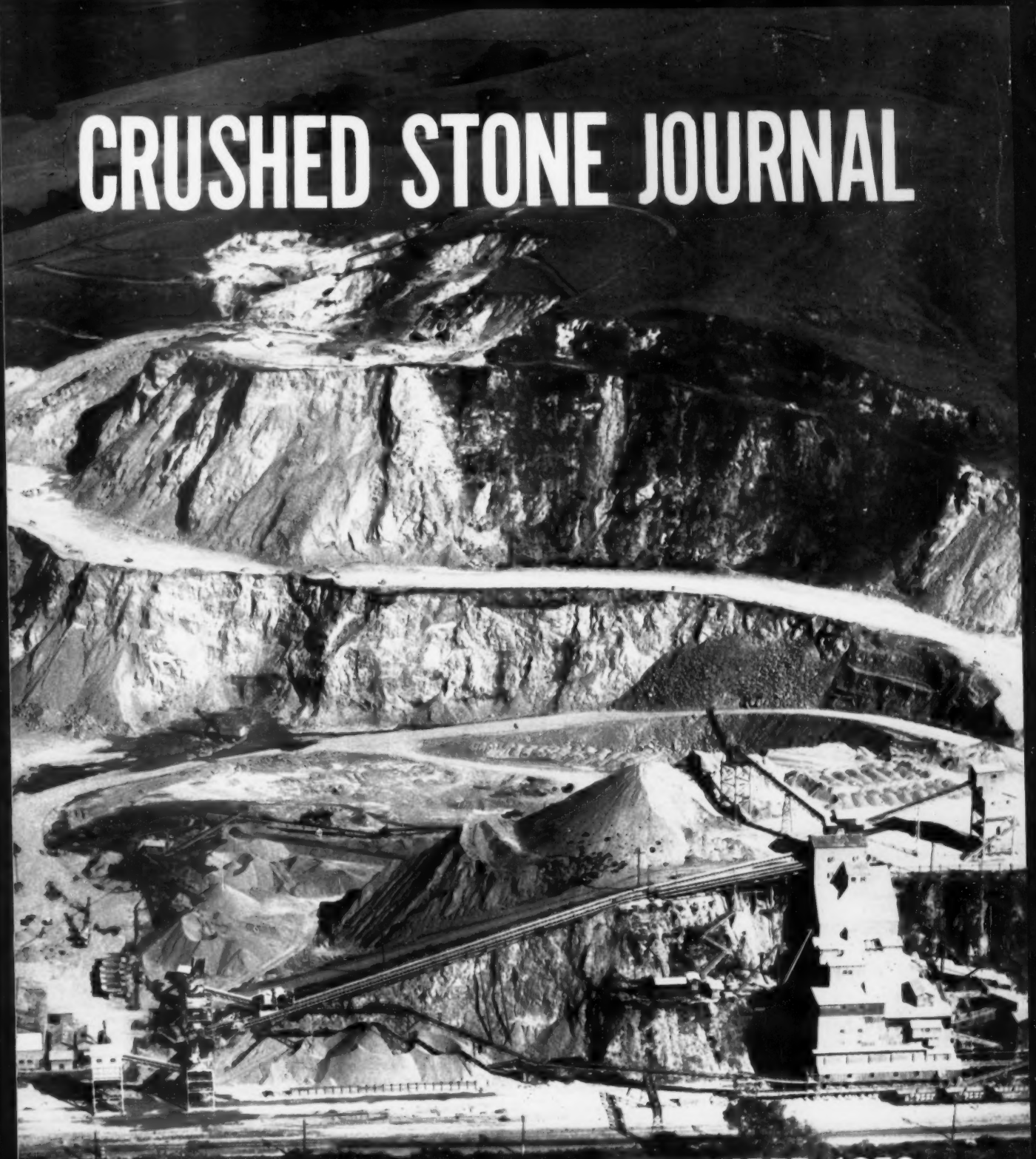
CRUSHED STONE JOURNAL



SEPTEMBER 1958

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Crushed Stone Journal

Official Publication of the NATIONAL CRUSHED STONE ASSOCIATION

Vol. XXXIII No. 3 PUBLISHED QUARTERLY September 1958

NATIONAL CRUSHED STONE ASSOCIATION

1415 Elliot Place, N. W.
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Contents

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42ND ANNUAL CONVENTION

of the

NATIONAL CRUSHED STONE ASSOCIATION

January 27-30, 1959

Americana Hotel • *Miami Beach, Florida*

Awards of the 1957 Safety Competition of the National Crushed Stone Association

By ELIZABETH K. ELSNER

Under the Supervision of John C. Machisak
Chief, Branch of Accident Analysis, Division of Safety
United States Bureau of Mines
Washington, D. C.

THE over-all injury experience at crushed stone operations participating in the National Crushed Stone Association Safety Competition of 1957 was one of the best in the 32 year history of the contest, according to the Bureau of Mines, United States Department of the Interior. Injury records have improved over the competing years, and in 1957 both the severity and frequency of injuries were lower than in the preceding year. The injury severity rate of 1,097.040 days lost per million man-hours worked in 1957 is the second lowest in 32 years of competition; the lowest was in 1945, when the rate was 1,093.384. The 1957 rate was 75 per cent improvement over the rate of 4,358.784 in 1956, and a 78 per cent improvement over the 32 year over-all severity rate of 4,875.722. In 1957, the injury frequency rate was 18.458 per million man-hours of exposure to hazard, or 2 per cent less than the similar rate of 18.809 in 1956 and 33 per cent less than the 32 year rate of 27.347. These improvements indicate the usefulness of safety competitions and furnish an incentive to participation in accident prevention programs.

Winning Plant

Highest safety honors in the 1957 National Crushed Stone Association Safety Competition were won by the Clinton Point quarry of the New York Trap Rock Corp. at New Hamburg, N. Y. This dolomitic limestone quarry won the bronze plaque provided by the Explosives Engineer Magazine for the outstanding safety accomplishment of having operated 374,800 man-hours without a lost time injury during 1957. In 1957, for the first time, this plant had the best safety record of all competing operations. The Clinton Point quarry has been enrolled in the competition for 12 of the 32 years. During this period the quarry has operated 3,428,267 man-hours with an over-all frequency rate of 35.003 and severity rate of 1,688.317 days lost per million man-hours of exposure to hazard. The Company's outstanding safety accomplishment in 1957 is clear evidence that management and labor have cooperated in an effective safety program to eliminate hazards of the quarrying industry. The contribution of each employee at the Clinton Point quarry to the success of the entire program of eliminating injuries throughout 1957 is recognized by the award of individual certificates to the men by the National Crushed Stone Association.

The Kingston No. 3 quarry of Callanan Road Improvement Co. at Kingston, N. Y., ranked second in the 1957 competition with the outstanding achievement of having worked 301,560 man-hours without a lost time disabling injury. The Tomkins Cove quarry of the New York Trap Rock Corp. at Tomkins Cove, N. Y., ranked third in the competition with a safety accomplishment of 264,500 man-hours of exposure without any injuries.

Injury Free Operations

The following 45 plants, of which 8 are underground mines and 37 are open quarries, attained injury free records in 1957 and were awarded Certificates of Honorable Mention also provided by the Explosives Engineer Magazine. Including the trophy winners, the 45 injury free operations worked 3,282,875 man-hours, or approximately 1/3 of the total man-hours worked at all 105 plants competing in the competition. The number of injury free operations show clearly that persistent and well-directed efforts aimed at the elimination of accidents from daily work pays off in the long run.

Clinton Point Quarry, New York Trap Rock Corporation, New Hamburg, Dutchess County, New York; 374,800 man-hours.

Kingston Plant No. 3 quarry, Callanan Road Improvement Company, Kingston, Ulster County, New York; 301,560 man-hours.

TABLE I

RELATIVE STANDING OF QUARRIES IN THE 1957 NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, BASED UPON THE INJURY SEVERITY RATES OF THE QUARRIES [1]

Rank	Man-hours worked	Number of injuries [2]					Average days of disability per temp. injury	Number of days of disability [2]					Frequency rate [3]	Severity rate [4]
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
1	374,800	—	—	—	—	—	—	—	—	—	—	—	0.000	0.000
2	301,560	—	—	—	—	—	—	—	—	—	—	—	.000	.000
3	264,500	—	—	—	—	—	—	—	—	—	—	—	.000	.000
4	215,688	—	—	—	—	—	—	—	—	—	—	—	.000	.000
7	145,215	—	—	—	—	—	—	—	—	—	—	—	.000	.000
8	142,693	—	—	—	—	—	—	—	—	—	—	—	.000	.000
9	96,180	—	—	—	—	—	—	—	—	—	—	—	.000	.000
10	83,900	—	—	—	—	—	—	—	—	—	—	—	.000	.000
12	80,600	—	—	—	—	—	—	—	—	—	—	—	.000	.000
13	62,106	—	—	—	—	—	—	—	—	—	—	—	.000	.000
14	61,229	—	—	—	—	—	—	—	—	—	—	—	.000	.000
15	60,808	—	—	—	—	—	—	—	—	—	—	—	.000	.000
16	58,928	—	—	—	—	—	—	—	—	—	—	—	.000	.000
17	58,016	—	—	—	—	—	—	—	—	—	—	—	.000	.000
18	56,776	—	—	—	—	—	—	—	—	—	—	—	.000	.000
19	51,300	—	—	—	—	—	—	—	—	—	—	—	.000	.000
20	50,542	—	—	—	—	—	—	—	—	—	—	—	.000	.000
21	49,496	—	—	—	—	—	—	—	—	—	—	—	.000	.000
22	48,933	—	—	—	—	—	—	—	—	—	—	—	.000	.000
23	46,762	—	—	—	—	—	—	—	—	—	—	—	.000	.000
24	46,500	—	—	—	—	—	—	—	—	—	—	—	.000	.000
25	42,888	—	—	—	—	—	—	—	—	—	—	—	.000	.000
29	30,420	—	—	—	—	—	—	—	—	—	—	—	.000	.000
30	28,800	—	—	—	—	—	—	—	—	—	—	—	.000	.000
31	27,104	—	—	—	—	—	—	—	—	—	—	—	.000	.000
32	26,992	—	—	—	—	—	—	—	—	—	—	—	.000	.000
34	24,000	—	—	—	—	—	—	—	—	—	—	—	.000	.000
35	22,507	—	—	—	—	—	—	—	—	—	—	—	.000	.000
36	20,000	—	—	—	—	—	—	—	—	—	—	—	.000	.000
38	18,628	—	—	—	—	—	—	—	—	—	—	—	.000	.000
39	16,800	—	—	—	—	—	—	—	—	—	—	—	.000	.000
40	14,721	—	—	—	—	—	—	—	—	—	—	—	.000	.000
41	12,536	—	—	—	—	—	—	—	—	—	—	—	.000	.000
42	12,121	—	—	—	—	—	—	—	—	—	—	—	.000	.000
43	10,752	—	—	—	—	—	—	—	—	—	—	—	.000	.000
44	8,800	—	—	—	—	—	—	—	—	—	—	—	.000	.000
45	5,280	—	—	—	—	—	—	—	—	—	—	—	.000	.000
46	142,244	—	—	—	1	1	4	—	—	—	4	4	7.030	28.121
47	71,812	—	—	—	1	1	4	—	—	—	4	4	13.925	55.701
49	34,651	—	—	—	2	2	2	—	—	—	3	3	57.718	86.578
50	70,976	—	—	—	1	1	7	—	—	—	7	7	14.089	98.625
51	91,200	—	—	—	1	1	10	—	—	—	10	10	10.965	109.649
52	57,938	—	—	—	1	1	9	—	—	—	9	9	17.260	155.338
53	76,036	—	—	—	2	2	7	—	—	—	13	13	26.303	170.972
54	51,350	—	—	—	1	1	10	—	—	—	10	10	19.474	194.742
55	73,465	—	—	—	1	1	15	—	—	—	15	15	13.612	204.179
56	149,095	—	—	—	2	2	17	—	—	—	34	34	13.414	228.043
57	672,216	—	—	—	5	5	31	—	—	—	154	154	7.438	229.093
58	462,500	—	—	—	11	11	10	—	—	—	110	110	23.784	237.838
59	33,245	—	—	—	1	1	8	—	—	—	8	8	30.080	240.638
60	150,000	—	—	—	4	4	10	—	—	—	40	40	26.667	266.667
61	191,493	—	—	—	3	3	18	—	—	—	54	54	15.666	281.995
62	21,000	—	—	—	2	2	3	—	—	—	6	6	95.238	285.714
63	96,000	—	—	—	5	5	6	—	—	—	29	29	52.083	302.083
64	210,627	—	—	—	5	5	13	—	—	—	64	64	23.739	303.855
65	34,566	—	—	—	1	1	11	—	—	—	11	11	28.930	318.232
66	125,000	—	—	—	4	4	10	—	—	—	40	40	32.000	320.000
67	78,848	—	—	—	3	3	13	—	—	—	39	39	38.048	494.623
68	123,445	—	—	—	2	2	31	—	—	—	62	62	16.202	502.248
69	157,050	—	—	—	4	4	21	—	—	—	83	83	25.470	528.494
70	53,743	—	—	—	4	4	7	—	—	—	29	29	74.428	539.605
71	126,694	—	—	—	3	3	24	—	—	—	72	72	23.679	568.298
72	89,655	—	—	—	6	6	9	—	—	—	51	51	66.923	568.847
73	312,800	—	—	—	3	3	60	—	—	—	179	179	9.591	572.251
74	241,796	—	—	—	3	3	47	—	—	—	141	141	12.407	583.136
75	25,074	—	—	—	2	2	8	—	—	—	15	15	79.764	598.229
76	249,917	—	—	1	1	2	38	—	—	150	38	188	8.003	752.250
78	33,451	—	—	—	2	2	13	—	—	—	26	26	59.789	777.256

(CONTINUED)

TABLE I

RELATIVE STANDING OF QUARRIES IN THE 1957 NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, BASED UPON THE INJURY SEVERITY RATES OF THE QUARRIES [1]—Continued

Rank	Man-hours worked	Number of injuries [2]					Average days of disability per temp. injury	Number of days of disability [3]					Frequency rate [4]	Severity rate [4]
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
79	49,652	—	—	—	1	1	54	—	—	—	54	54	20.140	1,087.569
80	41,426	—	—	—	1	1	48	—	—	—	48	48	24.139	1,158.693
81	46,141	—	—	—	1	1	57	—	—	—	57	57	21.673	1,235.344
82	57,804	—	—	—	1	1	72	—	—	—	72	72	17.300	1,245.589
83	112,900	—	—	—	4	4	36	—	—	—	144	144	35.430	1,275.465
84	43,056	—	—	—	4	4	17	—	—	—	58	58	92.902	1,347.083
85	46,400	—	—	—	3	3	21	—	—	—	63	63	64.655	1,357.759
86	120,512	—	—	—	8	8	22	—	—	—	175	175	66.383	1,452.138
87	186,081	—	—	—	8	8	35	—	—	—	282	282	42.992	1,515.469
88	101,414	—	—	—	1	1	155	—	—	—	155	155	9.861	1,528.389
89	35,148	—	—	—	2	2	29	—	—	—	57	57	56.902	1,621.714
91	196,952	—	—	1	5	6	57	—	—	75	284	359	30.464	1,822.779
93	147,680	—	—	1	5	6	15	—	—	300	75	375	40.628	2,539.274
94	89,151	—	—	—	1	1	259	—	—	—	259	259	11.217	2,905.183
95	51,816	—	—	—	3	3	57	—	—	—	172	172	57.897	3,319.438
96	23,500	—	—	—	1	1	90	—	—	—	90	90	42.553	3,829.787
97	59,840	—	—	—	4	4	67	—	—	—	268	268	66.845	4,478.610
98	50,725	—	—	—	4	4	68	—	—	—	270	270	78.857	5,322.819
99	35,311	—	—	—	1	1	196	—	—	—	196	196	28.320	5,550.678
100	31,778	—	—	1	1	2	1	—	—	300	1	301	62.937	9,471.962
101	38,196	—	—	—	12	12	32	—	—	—	384	384	314.169	10,053.409
102	119,486	—	—	1	1	2	35	—	—	1,200	35	1,235	16.738	10,335.939
103	60,764	—	—	2	2	4	8	—	—	675	16	691	65.828	11,371.865
104	132,304	—	—	2	—	2	—	—	—	1,600	—	1,600	15.117	12,093.361
Totals and rates:														
1957 [5]	8,864,805	—	—	9	161	170	28	—	—	4,300	4,575	8,875	19.177	1,001.150
1956	7,493,083	4	1	6	134	145	29	24,000	6,000	2,684	3,897	36,581	19.351	4.882

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed.
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.
[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per million man-hours of exposure.
[4] Beginning with 1957, the severity rates will be based on per million man-hours of exposure.

Tomkins Cove Quarry, New York Trap Rock Corporation, Tomkins Cove, Rockland County, New York; 264,500 man-hours.

Krause Quarry No. 1, Columbia Quarry Company, Columbia, St. Clair County, Illinois; 215,688 man-hours.

Valmeyer No. 3 Limestone Mine, Columbia Quarry Company, Valmeyer, Monroe County, Illinois; 211,470 man-hours.

Pleasant Gap Mine, Standard Lime and Cement Company, Pleasant Gap, Centre County, Pennsylvania; 154,728 man-hours.

Cheektowaga Quarry, Federal Crushed Stone Corporation, Cheektowaga, Erie County, New York; 145,215 man-hours.

Pounding Mill Quarry, Pounding Mill Quarry Corporation, Pounding Mill, Tazewell County, Virginia; 142,693 man-hours.

South Bethlehem Plant No. 1 Quarry, Callanan Road Improvement Company, South Bethlehem, Albany County, New York; 96,180 man-hours.

West Nyack Quarry, New York Trap Rock Corporation, West Nyack, Rockland County, New York, 83,900 man-hours.

Kimballton Mine, Standard Lime and Cement Company, Kimballton, Giles County, Virginia; 82,993 man-hours.

Alden Quarry, Weaver Construction Company, Alden, Hardin County, Iowa; 80,600 man-hours.

Plainville Plant No. 4 Quarry, New Haven Trap Rock Company, Plainville, Hartford County, Connecticut; 62,106 man-hours.

Rock Hill Quarry, General Crushed Stone Company, Quakertown, Bucks County, Pennsylvania; 61,229 man-hours.

TABLE II

RELATIVE STANDING OF UNDERGROUND MINES IN THE 1957 NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, BASED UPON THE INJURY SEVERITY RATES OF THE MINES [1]

Rank	Man-hours worked	Number of injuries [2]					Average days of disability per temp. injury	Number of days of disability [2]					Frequency rate [3]	Severity rate [3]
		F.	P.T.	P.P.	Temp.	Total		F.	P.T.	P.P.	Temp.	Total		
5	211,470	—	—	—	—	—	—	—	—	—	—	—	0.000	0.000
6	154,728	—	—	—	—	—	—	—	—	—	—	—	.000	.000
11	82,993	—	—	—	—	—	—	—	—	—	—	—	.000	.000
26	38,219	—	—	—	—	—	—	—	—	—	—	—	.000	.000
27	36,360	—	—	—	—	—	—	—	—	—	—	—	.000	.000
28	31,560	—	—	—	—	—	—	—	—	—	—	—	.000	.000
33	26,251	—	—	—	—	—	—	—	—	—	—	—	.000	.000
37	19,413	—	—	—	—	—	—	—	—	—	—	—	.000	.000
48	53,480	—	—	—	2	2	2	—	—	—	4	4	37.397	74.794
77	18,056	—	—	—	1	1	11	—	—	—	11	11	55.383	609.216
90	266,004	—	—	—	3	3	147	—	—	—	442	442	11.278	1,661.629
92	55,287	—	—	—	7	7	15	—	—	—	104	104	126.612	1,881.093
105	107,014	—	—	1	—	1	—	—	—	1,500	—	1,500	9.345	14,016.858
Totals and rates:														
1957 [4]	1,105,835	—	—	1	13	14	43	—	—	1,500	561	2,061	12.683	1,867.127
1956	1,066,873	—	—	1	15	16	29	—	—	300	430	730	14.997	0.684

[1] As reports from mining co mpanies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability
[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per million man-hours of exposure
[4] Beginning with 1957, the severity rates will be based on per million man-hours of exposure

TABLE III

YEARLY SUMMARY—QUARRIES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-57 [1]

Year	Number of plants	Man-hours	Number of injuries [2]					Number of days of disability [2]					Frequency rate [3]	Severity rate [3]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1926	40	5,298,983	3	—	6	207	216	18,000	—	9,000	4,239	31,239	40.763	5.895
1927	48	7,876,791	9	—	2	458	469	54,000	—	2,100	7,186	63,286	59.542	8.034
1928	53	7,509,098	8	—	4	322	334	48,000	—	8,700	5,493	62,193	44.479	8.282
1929	53	7,970,325	4	—	5	286	295	24,000	—	5,760	5,533	35,293	37.012	4.428
1930	68	8,013,415	6	—	9	227	242	36,000	—	7,250	3,671	46,921	30.199	5.855
1931	58	5,085,857	4	—	13	198	215	24,000	—	18,660	3,540	46,200	42.274	9.084
1932	40	2,661,850	1	—	4	75	80	6,000	—	6,750	2,481	15,231	30.054	5.722
1933	40	2,704,871	1	—	1	67	69	6,000	—	48	2,893	8,941	25.510	3.306
1934	46	3,288,257	1	—	2	106	109	6,000	—	2,850	1,873	10,723	33.148	3.261
1935	46	4,166,306	2	1	8	77	88	12,000	6,000	9,900	3,015	30,915	21.122	7.420
1936	50	6,399,023	5	—	14	182	201	30,000	—	8,168	4,590	42,758	31.411	6.682
1937	47	6,199,001	7	—	9	136	152	42,000	—	5,875	4,461	52,336	24.520	8.443
1938	47	4,658,119	2	—	6	76	84	12,000	—	6,600	3,184	21,784	18.033	4.677
1939	44	4,219,086	2	—	2	51	55	12,000	—	4,800	1,678	18,478	13.036	4.380
1940	46	4,358,409	1	—	5	78	84	6,000	—	2,550	3,013	11,563	19.273	2.653
1941	47	5,777,587	3	—	5	98	106	18,000	—	9,300	2,266	29,566	18.347	5.117
1942	48	7,178,935	3	2	1	183	189	18,000	12,000	1,500	4,239	35,739	26.327	4.978
1943	34	4,750,314	4	—	5	134	143	24,000	—	7,146	3,862	35,008	30.103	7.370
1944	32	3,996,433	3	—	4	118	125	18,000	—	3,000	3,323	24,323	31.278	6.086
1945	46	6,087,037	—	—	1	135	136	—	—	750	3,505	4,255	22.343	.699
1946	46	7,292,175	1	—	6	197	204	6,000	—	5,141	4,130	15,271	27.975	2.094
1947	42	6,971,790	5	—	5	197	207	30,000	—	6,900	4,990	41,890	29.691	6.008
1948	47	6,953,569	4	—	11	181	196	24,000	—	8,018	4,642	36,660	28.187	5.272
1949	57	7,166,644	3	—	11	153	167	18,000	—	9,465	3,345	30,810	23.302	4.299
1950	45	6,510,173	2	—	7	153	162	12,000	—	3,854	3,825	19,679	24.884	3.023
1951	36	5,441,304	1	—	4	100	105	6,000	—	6,325	2,381	14,706	19.297	2.703
1952	36	5,279,849	3	—	3	111	117	18,000	—	1,674	2,296	21,970	22.160	4.161
1953	47	6,555,333	—	—	9	114	123	—	—	14,892	2,882	17,774	18.763	2.711
1954	55	5,880,228	1	—	9	95	105	6,000	—	6,905	2,272	15,177	17.856	2.581
1955	60	6,507,189	1	—	3	101	105	6,000	—	750	3,241	9,991	16.136	1.535
1956	64	7,493,083	4	1	6	134	145	24,000	6,000	2,684	3,897	36,581	19.351	4.882
1957 [4]	92	8,864,805	—	—	9	161	170	—	—	4,300	4,575	8,875	19.177	1,001.150
Total	—	189,115,839	94	4	189	4,911	5,198	564,000	24,000	191,615	116,521	896,136	27.486	4,738.556

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability
[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per thousand man-hours of exposure
[4] Beginning with 1957, the severity rates will be based on per million man-hours of exposure

TABLE IV

YEARLY SUMMARY UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926–57 [1]

Year	Number of plants	Man-hours worked	Number of injuries [2]					Number of days of disability [2]					Frequency rate [3]	Severity rate [3]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1926	3	517,926	—	—	—	34	34	—	—	—	533	533	65.646	1.029
1927	2	318,449	1	—	1	14	16	6,000	—	300	68	6,368	50.244	19.997
1928	5	542,193	1	—	1	68	70	6,000	—	300	888	7,188	129.105	13.257
1929	4	665,520	1	—	1	30	32	6,000	—	300	617	6,917	48.083	10.393
1930	6	595,367	1	—	1	15	17	6,000	—	225	468	6,693	28.554	11.242
1931	3	345,105	—	—	—	4	4	—	—	—	147	147	11.591	.426
1932	2	158,450	—	—	—	6	6	—	—	—	165	165	37.867	1.041
1933	3	229,381	—	—	—	11	11	—	—	—	349	349	47.955	1.521
1934	4	248,146	—	—	—	13	13	—	—	—	287	287	52.389	1.157
1935	2	175,994	—	—	—	3	3	—	—	—	249	249	17.046	1.415
1936	4	334,747	1	—	—	7	8	6,000	—	—	117	6,117	23.899	18.274
1937	3	364,680	—	—	—	3	3	—	—	—	91	91	8.226	.250
1938	3	334,442	—	—	—	2	2	—	—	—	133	133	5.980	.398
1939	4	393,039	—	—	1	7	8	—	—	600	457	1,057	20.354	2.689
1940	4	375,987	—	—	1	8	9	—	—	4,500	888	5,388	23.937	14.330
1941	4	591,568	—	—	1	15	16	—	—	750	169	919	27.047	1.553
1942	4	785,894	—	—	1	33	34	—	—	1,800	1,213	3,013	43.263	3.834
1943	5	1,019,771	—	—	3	45	48	—	—	4,950	1,123	6,073	47.069	5.955
1944	4	727,496	1	—	1	27	29	6,000	—	2,400	796	9,196	39.863	12.641
1945	7	1,238,845	—	—	2	22	24	—	—	3,000	755	3,755	19.373	3.031
1946	8	1,338,563	2	—	2	31	35	12,000	—	675	1,045	13,720	26.147	10.250
1947	8	1,291,162	5	—	1	29	35	30,000	—	75	1,588	31,663	27.107	24.523
1948	4	940,031	—	—	—	16	16	—	—	—	935	935	17.021	.995
1949	5	981,692	—	—	1	17	18	—	—	900	467	1,367	18.336	1.392
1950	6	1,102,273	1	—	1	25	27	6,000	—	3,000	810	9,810	24.495	8.900
1951	6	1,179,458	—	—	1	21	22	—	—	1,125	818	1,943	18.653	1.647
1952	6	1,137,449	—	—	—	19	19	—	—	—	583	583	16.704	.513
1953	6	1,260,523	—	—	—	12	12	—	—	—	487	487	9.520	.386
1954	12	915,362	1	—	—	9	10	6,000	—	—	754	6,754	10.925	7.379
1955	13	1,315,811	—	1	—	7	8	—	6,000	—	297	6,297	6.080	4.786
1956	12	1,066,873	—	—	1	15	16	—	—	300	430	730	14.997	.684
1957 [4]	13	1,103,835	—	—	1	13	14	—	—	1,500	561	2,061	12.683	1,867.127
Total	—	23,596,032	15	1	22	581	619	90,000	6,000	26,700	18,288	140,988	26.233	5,975.072

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed.
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.
[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per thousand man-hours of exposure.
[4] Beginning with 1957, the severity rates will be based on per million man-hours of exposure.

Bakers Quarry, Superior Stone Company, Monroe, Union County, North Carolina; 60,808 man-hours.

Cedar Hollow Quarry, Warner Company, Devault, Chester County, Pennsylvania; 58,928 man-hours.

Bonne Terre Quarry, Valley Dolomite Corporation, Bonne Terre, St. Francois County, Missouri; 58,016 man-hours.

Jamestown Quarry, Superior Stone Company, Jamestown, Guilford County, North Carolina; 56,776 man-hours.

Lima Quarry, National Lime & Stone Company, Lima, Allen County, Ohio; 51,300 man-hours.

Union Furnace Quarry, Warner Company—Bellefonte Division, Tyrone, Huntingdon County, Pennsylvania; 50,542 man-hours.

Prospect Stone No. 6 Quarry, Eastern Rock Products, Incorporated, Prospect, Oneida County, New York; 49,496 man-hours.

Sodus Quarry, General Crushed Stone Company, Sodus, Wayne County, New York; 48,933 man-hours.

White Haven Quarry, General Crushed Stone Company, White Haven, Luzerne County, Pennsylvania; 46,762 man-hours.

Big Horn Quarry, Weaver Construction Company, Warren, Carbon County, Montana; 46,500 man-hours.

Cypress Quarry, Charles Stone Company, Cypress, Johnson County, Illinois; 42,888 man-hours.

Cape Girardeau Mine, Federal Materials Company, Incorporated, Cape Girardeau, Cape Girardeau County, Missouri; 38,219 man-hours.

TABLE V

YEARLY SUMMARY QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-57 [1]

Year	Number of plants	Man-hours worked	Number of injuries [2]					Number of days of disability [2]					Frequency rate [3]	Severity rate [3]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1926	43	5,816,909	3	—	6	241	250	18,000	—	9,000	4,772	31,772	42.978	5.462
1927	50	8,195,240	10	—	3	472	485	60,000	—	2,400	7,254	69,654	59.181	8.499
1928	58	8,051,291	9	—	5	390	404	54,000	—	9,000	6,381	69,381	50.178	8.617
1929	57	8,635,845	5	—	6	316	327	30,000	—	6,060	6,150	42,210	37.865	4.888
1930	74	8,608,782	7	—	10	242	259	42,000	—	7,475	4,139	53,614	30.086	6.228
1931	61	5,430,962	4	—	13	202	219	24,000	—	18,660	3,687	46,347	40.324	8.534
1932	42	2,820,300	1	—	4	81	86	6,000	—	6,750	2,646	15,396	30.493	5.459
1933	43	2,934,252	1	—	1	78	80	6,000	—	48	3,242	9,290	27.264	3.166
1934	50	3,536,403	1	—	2	119	122	6,000	—	2,850	2,160	11,010	34.498	3.113
1935	48	4,342,300	2	1	8	80	91	12,000	6,000	9,900	3,264	31,164	20.957	7.177
1936	54	6,733,770	6	—	14	189	209	36,000	—	8,168	4,707	48,875	31.038	7.258
1937	50	6,563,681	7	—	9	139	155	42,000	—	5,875	4,552	52,427	23.615	7.987
1938	50	4,992,561	2	—	6	78	86	12,000	—	6,600	3,317	21,917	17.226	4.390
1939	48	4,612,125	2	—	3	58	63	12,000	—	5,400	2,135	19,535	13.660	4.236
1940	50	4,734,396	1	—	6	86	93	6,000	—	7,050	3,901	16,951	19.643	3.580
1941	51	6,369,155	3	—	6	113	122	18,000	—	10,050	2,435	30,485	19.155	4.786
1942	52	7,964,829	3	2	2	216	223	18,000	12,000	3,300	5,452	38,752	27.998	4.865
1943	39	5,770,085	4	—	8	179	191	24,000	—	12,096	4,985	41,081	33.102	7.120
1944	36	4,723,929	4	—	5	145	154	24,000	—	5,400	4,119	33,519	32.600	7.096
1945	53	7,325,882	—	—	3	157	160	—	—	3,750	4,260	8,010	21.840	1.093
1946	54	8,630,738	3	—	8	228	239	18,000	—	5,816	5,175	28,991	27.692	3.559
1947	50	8,262,952	10	—	6	226	242	60,000	—	6,975	6,578	73,553	29.287	8.902
1948	51	7,893,600	4	—	11	197	212	24,000	—	8,018	5,577	37,595	26.857	4.763
1949	62	8,148,336	3	—	12	170	185	18,000	—	10,365	3,812	32,177	22.704	3.949
1950	51	7,612,446	3	—	8	178	189	18,000	—	6,854	4,635	29,489	24.828	3.874
1951	42	6,620,762	1	—	5	121	127	6,000	—	7,450	3,199	16,649	19.182	2.515
1952	42	6,417,298	3	—	3	130	136	18,000	—	1,674	2,879	22,553	21.193	3.514
1953	53	7,815,856	—	—	9	126	135	—	—	14,892	3,369	18,261	17.273	2.336
1954	67	6,795,590	2	—	9	104	115	12,000	—	6,905	3,026	21,931	16.923	3.227
1955	73	7,823,000	1	1	3	108	113	6,000	6,000	750	3,538	16,288	14.445	2.082
1956	76	8,559,956	4	1	7	149	161	24,000	6,000	2,984	4,327	37,311	18.809	4.359
1957 [4]	105	9,968,640	—	—	10	174	184	—	—	5,800	5,136	10,936	18.458	1,097.040
Total	—	212,711,871	109	5	211	5,492	5,817	654,000	30,000	218,315	134,809	1,037,124	27.347	4,875.722

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed.
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.
[3] Frequency rate indicates the number of fatal, permanent, and other disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per thousand man-hours of exposure.
[4] Beginning with 1957, the severity rates will be based on per million man-hours of exposure.

TABLE VI

NUMBER OF INJURIES, BY CLASSIFICATIONS, AT QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION IN 1957

Classifications	Permanent			Temporary	Total
	Fatal	Total	Partial		
Falls and slides of rock	—	—	2	12	14
Handling materials	—	—	1	26	27
Hand tools	—	—	—	6	6
Explosives	—	—	—	1	1
Haulage	—	—	3	24	27
Falls of persons	—	—	—	33	33
Bumping against objects	—	—	—	7	7
Falling objects	—	—	1	12	13
Flying objects	—	—	—	13	13
Electricity	—	—	—	—	—
Drilling	—	—	2	8	10
Machinery	—	—	1	17	18
Stepping on objects	—	—	—	3	3
Burns	—	—	—	6	6
Other causes	—	—	—	5	5
Total	—	—	10	173	183
Not stated	—	—	—	1	1
Grand total	—	—	10	174	184

TABLE VII

DAYS OF DISABILITY, BY CLASSIFICATIONS, OF INJURIES AT QUARRIES AND UNDERGROUND MINES IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION IN 1957

Classifications	Permanent			Temporary	Total
	Fatal	Total	Partial		
Falls and slides of rock	—	—	2,700	456	3,156
Handling materials	—	—	375	459	834
Hand tools	—	—	—	45	45
Explosives	—	—	—	3	3
Haulage	—	—	1,800	980	2,780
Falls of persons	—	—	—	1,461	1,461
Bumping against objects	—	—	—	63	63
Falling objects	—	—	150	256	406
Flying objects	—	—	—	267	267
Electricity	—	—	—	—	—
Drilling	—	—	375	93	468
Machinery	—	—	400	579	979
Stepping on objects	—	—	—	12	12
Burns	—	—	—	160	160
Other causes	—	—	—	106	106
Total	—	—	5,800	4,940	10,740
Not stated	—	—	—	196	196
Grand total	—	—	5,800	5,136	10,936

Russellville Mine, Kentucky Stone Company, Russellville, Logan County, Kentucky; 36,360 man-hours.

Liberty Mine, Casey Stone Company, Liberty, Casey County, Kentucky; 34,560 man-hours.

Munnsville Quarry, Munnsville Limestone Corporation, Munnsville, Madison County, New York; 30,420 man-hours.

Cairo Quarry, Catskill Mountain Stone Corporation, Cairo, Greene County, New York; 28,800 man-hours.

Avoca Quarry, Jefferson County Stone Company, Incorporated, Avoca, Jefferson County, Kentucky; 27,104 man-hours.

Waukesha Quarry, Waukesha Lime and Stone Company, Incorporated, Waukesha, Waukesha County, Wisconsin; 26,992 man-hours.

Tyrone Mine, Kentucky Stone Company, Tyrone, Anderson County, Kentucky; 26,251 man-hours.

Buckland Quarry, National Lime and Stone Company, Buckland, Auglaize County, Ohio; 24,000 man-hours.

Osgood Quarry, South Eastern Materials Corporation, Osgood, Ripley County, Indiana; 22,507 man-hours.

Rimer Quarry, National Lime and Stone Company, Rimer, Putnam County, Ohio; 20,000 man-hours.

Boonesboro Mine, Kentucky Stone Company, Boonesboro, Madison County, Kentucky; 19,413 man-hours.

Metropolis No. 10 Quarry, Columbia Quarry Company, Metropolis, Massac County, Illinois; 18,628 man-hours.

East Liberty Quarry, National Lime and Stone Company, East Liberty, Logan County, Ohio; 16,800 man-hours.

Lick Creek Quarry, Columbia Quarry Company, Lick Creek, Union County, Illinois; 14,721 man-hours.

Randville Quarry, Superior Rock Products Company, Randville, Dickerson County, Michigan, 12,536 man-hours.

Knippa Plant No. 4 Quarry, Southwest Stone Company, Knippa, Uvalde County, Texas; 12,121 man-hours.

Pleasant Valley Quarry, Dutchess Quarry and Supply Company, Incorporated, Pleasant Valley, Dutchess County, New York; 10,752 man-hours.

Goshen Quarry, Dutchess Quarry and Supply Company, Incorporated, Goshen, Orange County, New York; 8,800 man hours.

Lowden Quarry, Weaver Construction Company, Lowden, Cedar County, Iowa; 5,280 man-hours.

Statistics of the Competition

Injury experience at the 105 operations competing in the 1957 National Crushed Stone Association Safety Competition was better than that in 1956 and much better than the over-all average for the competition since its inception 32 years ago. More plants participated in the competition than in any year of its history. A total of 9,968,640 man-hours were worked by participating operations, or a million more man-hours of exposure to hazard than in any other year. The injury severity rate of 1,097.040 days lost per million man-hours was the second lowest rate in 32 years and was well below the average rate of 4,875.722. The injury frequency rate of 18,458 injuries per million man-hours was lower only five times in 32 years—in 1939, 1955, 1954, 1938, and 1953, (in order of accomplishment).

The 105 competing operations worked a total of 9,968,640 man-hours in 1957. During this period, 184 injuries occurred at the operations. Ten caused permanent and 174 temporary disability. There were no fatalities. These 184 injuries resulted in 59 days of lost time per injury. This was a marked improvement over the 232 days lost for each injury in 1956 and an improvement of 67 per cent over the 32 year average of 178 days lost for each injury.

Of the operations enrolled in the 1957 National Crushed Stone Association Safety Competition, 92 were quarries and 13 were underground mines. The injury rates for the 92 open quarries were de-

TABLE VIII

NUMBER AND PERCENTAGE DISTRIBUTION OF INJURIES AT PLANTS ENROLLED IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION 1955–57, BY CLASSIFICATIONS

Classifications	1955		1956		1957		Total	
	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total
Falls and slides of rock	5	4.6	6	3.9	14	7.7	25	5.6
Handling materials	20	18.3	22	14.3	27	14.8	69	15.5
Hand tools	5	4.6	6	3.9	6	3.3	17	3.8
Explosives	1	.9	4	2.6	1	.5	6	1.3
Haulage	11	10.1	15	9.7	27	14.8	53	11.9
Falls of persons	13	11.9	28	18.2	33	18.0	74	16.6
Bumping against objects	5	4.6	7	4.5	7	3.8	19	4.3
Falling objects	15	13.8	23	14.9	13	7.1	51	11.4
Flying objects	4	3.7	9	5.8	13	7.1	26	5.8
Electricity	7	6.4	3	2.0	—	—	10	2.2
Drilling	3	2.7	—	—	10	5.5	13	2.9
Machinery	9	8.3	18	11.7	18	9.8	45	10.1
Stepping on objects	5	4.6	4	2.6	3	1.6	12	2.7
Burns	—	—	5	3.3	6	3.3	11	2.5
Other causes	6	5.5	4	2.6	5	2.7	15	3.4
Total	109	100.0	154	100.0	183	100.0	446	100.0
Causes not stated	4	—	7	—	1	—	12	—
Grand total	113	—	161	—	184	—	458	—

cidedly lower than in 1956. The injury severity rate of 1,001.150 days lost per million man-hours worked in 1957 was 79 per cent better than the rate of 4,881.969 for 1956 and 79 per cent better than the average rate of 4,738.556 for the 32 years of the competition. The injury frequency rate for 1957 (19.177 injuries per million man-hours worked) dropped less than 1 per cent (0.90) below the corresponding rate of 19.351 for 1956. However, the 1957 frequency rate was almost 1/3 less than the over-all rate of 27.486 for the 32 years.

Injury experience at the 13 underground mines was not so favorable in 1957 as in 1956. Although the 13 underground mines represented the greatest number ever entered in the competition, their severity rate of 1,867.127 was almost 3 times as high as the rate of 684.243 for the underground mines in 1956. The frequency rate for injuries at these underground mines was lower in 1957 than in 1956 or than the average rate for the 32 years of competition. The frequency rate of 12.683 injuries per million man-hours of exposure in 1957 was 15 per cent better than the rate of 14.997 for

TABLE IX

NUMBER OF AND PERCENTAGE DISTRIBUTION OF DAYS OF DISABILITY FROM INJURIES AT PLANTS ENROLLED IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1955–57, BY CLASSIFICATIONS

Classifications	1955		1956		1957		Total	
	Days of disability	Per cent of total	Days of disability	Per cent of total	Days of disability	Per cent of total	Days of disability	Per cent of total
Falls and slides of rock	35	0.2	6,235	16.8	3,156	29.4	9,426	14.7
Handling materials	820	5.2	6,606	17.7	834	7.8	8,260	12.9
Hand tools	38	.2	141	.4	45	.4	224	.3
Explosives	4	(1)	12,630	33.9	3	(1)	12,637	19.8
Haulage	579	3.6	6,866	18.4	2,780	25.9	10,225	16.0
Falls of persons	6,294	39.5	1,169	3.1	1,461	13.6	8,924	14.0
Bumping against objects	45	.3	309	.8	63	.6	417	.7
Falling objects	368	2.3	1,139	3.1	406	3.8	1,913	3.0
Flying objects	28	.2	64	.2	267	2.5	359	.6
Electricity	6,506	40.8	12	(1)	—	—	6,518	10.2
Drilling	111	.7	—	—	468	4.3	579	.9
Machinery	939	5.9	1,899	5.1	979	9.1	3,817	6.0
Stepping on objects	45	.3	27	.1	12	.1	84	.1
Burns	—	—	98	.3	160	1.5	258	.4
Other causes	126	.8	36	.1	106	1.0	268	.4
Total	15,938	100.0	37,231	100.0	10,740	100.0	63,909	100.0
Causes not stated	350	—	80	—	196	—	626	—
Grand total	16,288	—	37,311	—	10,936	—	64,535	—

(1) Less than 0.05 per cent

TABLE X

EMPLOYMENT AND INJURY DATA FOR CRUSHED STONE PLANTS ENROLLED IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1956 AND 1957, COVERING IDENTICAL PLANTS FOR BOTH YEARS AND PLANTS ENROLLED ONLY IN 1956 OR IN 1957 [1]

	No.	Man-hours worked	Number of injuries [2]					Days of disability [2]					Frequency rate [3]	Severity rate [3]
			F.	P.T.	P.P.	Temp.	Total	F.	P.T.	P.P.	Temp.	Total		
Plants enrolled in 1956 only	7	639,380	—	—	—	12	12	—	—	—	292	292	18.768	456.692
Identical plants enrolled both years, 1956	69	7,920,576	4	1	7	137	149	24,000	6,000	2,984	4,035	37,019	18.812	4,673.776
Identical plants enrolled both years, 1957	69	7,635,114	—	—	8	109	117	—	—	5,125	3,829	8,954	15.324	1,172.740
Plants enrolled in 1957 only	36	2,333,526	—	—	2	65	67	—	—	675	1,307	1,982	28.712	849.358

[1] As reports from mining companies are considered confidential by the Bureau of Mines, the identities of the operations to which this table relates are not revealed
[2] F., fatal; P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability
[3] Frequency rate indicates the number of fatal, permanent, and othe disabling injuries per million man-hours of exposure; severity rate indicates the number of days of disability lost from injuries per million man-hours of exposurer

TABLE XI

AVERAGE DAYS OF DISABILITY PER TEMPORARY INJURY AT PLANTS ENROLLED IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY COMPETITION, 1926-57

Year	Underground mines			Open quarries			Total		
	Number of temporary injuries	Number of days of disability	Average days of disability	Number of temporary injuries	Number of days of disability	Average days of disability	Number of temporary injuries	Number of days of disability	Average days of disability
1926	34	533	16	207	4,239	20	241	4,772	20
1927	14	68	5	458	7,186	16	472	7,254	15
1928	68	888	13	322	5,493	17	390	6,381	16
1929	30	617	21	286	5,533	19	316	6,150	19
1930	15	468	31	227	3,671	16	242	4,139	17
1931	4	147	37	198	3,540	18	202	3,687	18
1932	6	165	28	75	2,481	33	81	2,646	33
1933	11	349	32	67	2,893	43	78	3,242	42
1934	13	287	22	106	1,873	18	119	2,160	18
1935	3	249	83	77	3,015	39	80	3,264	41
1936	7	117	17	182	4,590	25	189	4,707	25
1937	3	91	30	136	4,461	33	139	4,552	33
1938	2	133	67	76	3,184	42	78	3,317	43
1939	7	457	65	51	1,678	33	58	2,135	37
1940	8	888	111	78	3,013	39	86	3,901	45
1941	15	169	11	98	2,266	23	113	2,435	22
1942	33	1,213	37	183	4,239	23	216	5,452	25
1943	45	1,123	25	134	3,862	29	179	4,985	28
1944	27	796	29	118	3,323	28	145	4,119	28
1945	22	755	34	135	3,505	26	157	4,260	27
1946	31	1,045	34	197	4,130	21	228	5,175	23
1947	29	1,588	55	197	4,990	25	226	6,578	29
1948	16	935	58	181	4,642	26	197	5,577	28
1949	17	467	27	153	3,345	22	170	3,812	22
1950	25	810	32	153	3,825	25	178	4,635	26
1951	21	818	39	100	2,381	24	121	3,199	26
1952	19	583	31	111	2,296	21	130	2,879	22
1953	12	487	41	114	2,882	25	126	3,369	27
1954	9	754	84	95	2,272	24	104	3,026	29
1955	7	297	42	101	3,241	32	108	3,538	33
1956	15	430	29	134	3,897	29	149	4,327	29
1957	13	561	43	161	4,575	28	174	5,136	30
Total	581	18,288	31	4,911	116,521	24	5,492	134,809	25

1956 and 52 per cent better than the average rate of 26.233 for the 32 year period.

Twenty-one states were represented by the 105 crushed stone operations enrolled in the 1957 competition. Twenty-two operations were in New York, 13 in Pennsylvania, 10 in Kentucky, 9 each in Ohio and Illinois, 7 each in Missouri and North Carolina, 4 each in Virginia and Wisconsin, 3 each in Connecticut and Michigan, 2 each in Iowa, Maryland, Massachusetts, and Texas, and 1 each in Georgia, Oklahoma, Montana, Indiana, South Dakota, and Tennessee.

Causes of Injuries

The frequency of injuries with stated causes was highest for falls of persons, which accounted for 18 per cent of the total number of injuries. Handling materials and haulage ranked second and third with 14.8 per cent each. Machinery caused 9.8 per cent of all injuries. These four classifications accounted for 105 injuries or 57.4 per cent of all injuries with stated causes. The severity of injuries by causes showed a different distribution from the frequency of injuries. Falls and slides of rock accounted for 29.4 per cent of the days of disability for all injuries at competing plants. Haulage resulted in the next highest severity rate with 25.9 per cent of all days lost from injuries; falls of persons resulted in 13.6 per cent of the days of disability; followed by machinery with 9.1 per cent. Although falls and slides of rock or material caused only 7.7 per cent of the total number of injuries in 1957, these injuries resulted in 29.4 per cent of the total days lost from all injuries, owing largely to the 2 permanent partial injuries with 2,700 days of disability from this by the Bureau of Mines under the same rules

The Competition

The annual competition for the promotion of safety in the crushed stone industry is conducted by the Bureau of Mines under the same rules as the National Safety Competition, and the same records are used in both contests. Two additional qualifications for the National Crushed Stone Association Safety Competition are that the operation must have commercial production of crushed stone and that the company must be a member of the National Crushed Stone Association.

A plant may be enrolled on application to the Branch of Accident Analysis, Division of Safety, United States Bureau of Mines, Washington 25, D. C.

Congress Approves Federal Highway Laws Codification Act

CONGRESS has approved and the President signed into law August 27, 1958 the bill (HR 12776) to codify and restate the federal-aid and other highway laws into one act to be known as "Title 23, U. S. Code, 'Highways'." The bill has been sent to the White House for President Eisenhower's action.

The legislation, which includes the 1958 Act, makes it possible for the first time in almost 40 years to have available and easily accessible in one act all of the federal laws pertaining to federal-aid highways. Since passage of the first Federal-Aid Road Act of 1916, 40 separate highway laws have been enacted—not counting the many appropriation acts.

The new legislation arranges the many provisions of law in an orderly, logical sequence so that the provisions concerning a particular problem may be quickly located. In bringing the provisions of existing law together in a more logical arrangement, it was necessary in many instances, to make changes from the exact language used in prior enactments. However, no substantive changes of law have been made, with the exception of certain minor changes and additions, principally in areas of administration, which are in line with existing practices and procedures.

The Senate made only one material amendment to the House-passed bill, which was then accepted by the House. This omitted the requirement that states have "more than five per centum of their area" in unappropriated or unreserved public lands, nontaxable Indian lands, or other federal reservations in order to participate in funds for public lands highways. All states with public lands would be permitted to participate in the apportionment of these funds.

The new law is arranged in three chapters under "Title 23—Highways"—(1) Federal-Aid Highways, which includes all primary, secondary and urban systems; (2) Other Highways, consisting of national park roads, access roads, military establishments, and roads on public lands; and (3) General Provisions, covering such areas as financing, trust funds and special studies.

Controlling the "Paper Monster"*

By ALFRED H. DORSTEWITZ

Sales Manager, Stivers Office Service
Chicago, Illinois

THE control of paper work in business is generally referred to as the management of records. Must we have management of records in our businesses of today? And will records management be even more important in the future? To understand the answers I suggest that we let our minds drift back many, many years into ancient history.

Of all the discoveries and inventions by which man has created what we call civilization, the most decisive has been the instrument which enabled him to make a permanent record of his own achievement and history. Such an instrument is the art of writing.

Archeological evidence shows that between the years 5,000 and 4,000 B. C. there settled in the delta of the twin rivers of Mesopotamia a people known as the Sumerians. A most important legacy of the Sumerians was their system of recording which gradually passed out of the realm of mere pictographs. The earliest known examples of writing came to us in the form of clay tablets from the temple of Inanna at Erech.

In Egypt, as in Mesopotamia, the earliest form of records were pictures of recognizable objects. These too were made in tablets of soft clay. Then the Egyptians discovered the papyrus reed and papyrus leaf which provided an unlimited source of excellent writing material with which to perfect a graphic art.

The Egyptians, of course, had their carvings in stone as the Pyramids and ancient rock formations portray. These were pictures and hieroglyphic inscriptions created in stone with hammer and chisel.

This was, of course, a laborious task and you can well imagine that if today we had to use this type of records-keeping system, not many records would be kept.

Later came the use of sheepskin scrolls for writing and records, as evidenced by the recent discovery of these scrolls in caves of the Dead Sea. These scrolls were used by the Essenes, a Hebrew religious sect in existence 150 years B. C.

Here again, not too many records were kept but it was somewhat easier than using stone or clay.

First Developments

In China, in the year 105 B. C., Ts'ai Lun announced the invention of paper making to the Emperor. This paper was made from mulberry and other barks, fish nets, hemp, and rags. This form of paper was called Papyrus, and from the word Papyrus we derived the word Paper.

Now we had given birth to paper. As the years progressed refinements of many sorts were made in paper quality until the year 900 A. D. when true paper was made for the first time in Egypt, using the methods of the Chinese.

Soon the production of paper was spreading commonly throughout the world: 1228 A. D. in Germany, 1495 A. D. in England, 1572 A. D. in Russia, 1678 A. D. in America.

Each year improvements in paper have been effected that made it simpler, less expensive, and less time consuming to keep records, or historical information, if you will.

As though refinements in paper manufacturing were not enough, we also introduced mechanization with the invention of the typewriter—around 1875. Typewriters were costly but they saved expensive labor and gave better results. And so, records were created in quantities never dreamed of in the past.

Next came the introduction of carbon paper just prior to the year 1900. Then the mimeograph, photo-lithography, and chemical processes of duplication followed, which presented little or no limitation to copy making and more records keeping by clerical staffs.

By the way, have you ever wondered where the word "clerk" came from? The word "clerk" stems from the same Greek source as "clergy." Much of the clerical work performed during the Middle Ages was in connection with the church—which maintained vital statistics in the community. These were records such as births, marriages, and deaths. With the passing of time the term "clerk" became associated with one who

* Presented before the Springfield Chapter of the National Office Management Association, Springfield, Illinois, February 19, 1958

kept records or who performed work which required writing.

The Problem of Storage

It is also interesting to note that some of these old church records, when they became voluminous, were stored in the steeple or belfry because that was considered not only a safe place but also space that had no better use.

Now let us turn back to the year 1860 when a Bellows File was designed for the storing of records. This soon became outmoded and a Flat File became the first attempt to file in a cabinet equipped with drawers. Then in succession came the Box File in 1875, the Shannon File in 1880, the Suspended Flat File in 1885. Then in 1892 the first Vertical Letter File was introduced. And the following year in 1893 it was demonstrated at the Chicago Worlds Fair. Of course these Vertical Letter Files were built of wood and, at that time were only 2 drawers in height. But now a workable filing cabinet had been produced and people had a place to keep all of the papers and records that they were now creating. Because we filled those so fast, we soon designed a 3-drawer cabinet. We needed still more capacity and so to the 4-drawer—and 5-drawer—and now we have the 6-drawer cabinet. All because we must make better utilization of expensive floor space to store masses of paper that have been created in our offices. Now, even the 6-drawer cabinet has not provided us sufficient capacity for an inexpensive and adequate housing of our paper work; so we have created what is known as Shelf Filing, which begins at the floor and may go all the way to the ceiling. Frankly, I do not know what we can think of next. I would say that we had better start controlling the paper instead of building the roofs higher.

Handling Costs

Now, here again, let me take you back into the 1930's, during which time a revolution in business took place, and Government controls were instituted right and left. This meant additional paper work was required of businesses, to meet these ever-mounting governmental controls. During the war years additional controls were instituted to the point where the offices were actually inundated by a flood of paper work. Now, add to this the fact that, through office mechanization over the past years, we have created many machines that will turn out more records and more copies of these records. With increasing regularity management feels it needs six or more copies instead of one of every document they request. At the same time each department feels that it must keep a copy of everything, and so the mountain of paper grows right through the ceiling.

I like to visualize this as a "Paper Monster" that is eating up the profits of the organization as fast as they can be earned. Have you ever stopped to think that an organization, that has a 10 per cent mark-up ratio, for every $100,000 of cost would have to produce $1 million dollars more in sales just to break even? And then it is merely changing dollars and getting nowhere. Many organizations constantly strive to increase their sales volume, decrease their production costs, and yet do not recognize the extravagance of their paper-work operation. All of these happenings over many, many years have placed us in a position where it is now estimated that there are 8 million men and women—1/8 or 12 1/2 per cent of all the United States workers, now employed in office work. That represents a 64 per cent increase since 1940. As both the percentage and the number of white collar workers has risen, the cost of handling paper-work has soared to stratospheric heights.

It is estimated that it costs:

$ 0.01	one cent to file one piece of paper
1.50	to produce the average letter
7.50	annually to maintain one cubic foot of records in the office, exclusive of personnel cost
196.00	annually to maintain a 4-drawer file—including personnel
6,200.00	to create and file the contents of a 4-drawer file
100,000,000,000.00	a year in America to prepare records, forms, and file them

Now considering that the average file drawer will hold approximately 3,500 pieces of paper, when you return to your office, count the number of file drawers that you have in your active file area. Multiply those figures by the costs I have

given you, and you will readily see how much money is being spent in your office, to house and maintain your records.

No End in Sight

Statistics show that United States businessmen are creating a new file drawer of papers for every employee each year. On that basis, if there are 67 million workers in the United States, we are creating in the neighborhood of 67 million file drawers of material annually. This is the equivalent of 16 3/4 million 4-drawer file cabinets at an estimated cost of $6,200 per cabinet to prepare, handle, and file. This adds up to $108.5 billion to create records annually! Now, 16 3/4 million 4-drawer file cabinets will require about 100 million square feet of office space. If you will project that on the high cost of square foot rentals of office space you will begin to see what I mean when I say, our profits of today are being devoured by the "Paper Monster." We have allowed ourselves to travel at jet speed, into the jungle of paper work. Unless we institute controls of our records-keeping problems, we will find ourselves under such an avalanche of paper, with its burden of cost, that the economies will be seriously affected, and our production costs will be in an ever-mounting spiral.

Records Management

Now that all of you understand that paper work has become one of the costliest activities of business, and that it has become a drain on both our budgets and efficiency, let us see what can be done to control this "Paper Monster." First, what do we mean when we say "Records Management?" Records Management is a systematic control of paper work from its conception to its destruction, or retention if it is a permanent document. That is to say, we control the creation of paper work, apply the more efficient systems, people, and equipment in maintaining our everyday paper load, and finally, we apply a retention and destruction program on a planned, logical, and scientific basis.

To effectively apply these principles of Records Management, we must first have someone in the organization to whom is delegated the authority for management of the records. This person must have the support of top management in the control of this paper work; otherwise, the system will break down before it gets started.

Next, we must realize that for efficiency and ease of operation, certain records must be maintained in the active office area, for a prescribed length of time, because they are used in the daily operation of the office. There are many estimates as to the percentage of records that must be kept in active areas as well as inactive areas. This percentage depends upon the type of industry, the frequency of reference, and the peculiarities of management. These estimates range from 30 to 50 per cent for records that should be maintained in active areas; 22 to 30 per cent of the records should be maintained in a low-cost records storage center, on a formal retention and destruction basis. That is to say, as these records enter the storage area, a predetermined destruction date is automatically placed on them, so that they will be retained only the period of time needed for company reference, to meet legal requirements, governmental controls, and sound practices of good records-keeping. The remaining 20 to 48 per cent probably should never be retained for any period.

It is safe to say that no more than 6 per cent of the records of a business are of a permanent nature and should never be destroyed. And, for those records that are of a permanent nature, it is usually good practice to have them microfilmed for security purposes. A retention program such as this will reduce the waste and costs of expensive office space, the paper handling by office personnel, the purchase of unneeded equipment, and the maintenance of inactive records in a records center with rigid control and low cost operation.

Let me cite some examples where sound Records Management programs have really paid off:

Scott Paper Company of Chester, Pennsylvania, eliminated 4,108 cubic feet of records or about 8 million pieces of paper from its files after an analysis of its filing system. The study disclosed that 44 per cent of the paper in the files was being kept needlessly. Another 21 per cent of records were transferred from expensive office space to low-cost storage leaving only 35 per cent of records, or 3,232 cubic feet, remaining in an active status in the office. One entire records storage building, with a rental of $12,000 annually, was freed for other uses, as was $11,800 of filing equipment.

Campbell Soup Company of Camden, New Jersey, found, through an analysis of their records, that 44 per cent of records in files could be de-

stroyed, 34 per cent removed to a records storage center, and only 22 per cent left in the active files in the office.

An analysis at Richfield Oil Company of Los Angeles, showed that 39 per cent of its records could be destroyed, 36 per cent moved to less costly storage, and only 25 per cent considered necessary for active files.

When Monsanto Chemical Company analyzed its records, they found that they had 82,900,000 pieces of paper in office file cabinets alone, plus an equal amount in dead storage. Oddly enough, this analysis disclosed material located in files that were labeled: "Rock thrown through windows during strike of 1887." A formal retention program was set up and all unnecessary records were junked. The savings in floor space and release of filing cabinets alone were estimated at $157,000 for the year 1956.

Permanent Files?

In making records analyses one never quite knows what he may find. The usual, other than papers, of course, are empty coke bottles, coffee urns, worn out rubbers, unused lunches, and those long forgotten hats. I well remember one instance of a whiskey bottle, empty of course, that was so thickly covered with dust that we could not read the label until it had been wiped off. I assure you that had the content of that bottle been aged for as many years as the bottle was in the file cabinet, it would have been of rare vintage.

I remember an instance where we found a pair of old shoes, low heels, with a slit in each toe for ease and comfort, and high buttoned tops. Now I ask you, how old were they?

A New York trust company found an urn containing the ashes of a cremated body in their files. Nobody knows how long the urn had been there but evidence indicated it may have been "interred" during the Civil War era with the effects of an unsettled estate, and then forgotten.

These are just a few of the many amusing incidents where businesses are spending money to house unnecessary items in costly equipment consuming badly needed space.

Now let me present the serious side of what may be found in records studies. A rare example of what "old miscellaneous" files may contain happened when a records organizer uncovered a deed to some Texas property among old correspondence. When this deed was laid on the President's desk, he almost went into a state of shock. This property had been acquired in a settlement of a bad debt. Some years later oil was discovered on the property and they had searched in vain for the deed to prove their ownership. This Records Management program really paid off in "black gold."

Opportunity for Savings Unlimited

A recent survey of the records of the State of Illinois estimates a saving of $850,000 a year by stopping the creation of more than 10 million unnecessary pieces of paper annually. Some 480 tons of paper taking up valuable space were destroyed. Filing of more than 7 million pieces of paper annually, not needed to carry on state business, was abolished. Some 41 million processing operations were stopped, and 3 1/2 million hand operations were mechanized.

According to the Hoover Commission Report—the Federal Government creates and handles some 25 billion pieces of paper each year (exclusive of technical manuals, pamphlets, periodicals, etc.). To do this, it employs 750,000 full time employees. The total cost of this paper work is $4 bi'lion a year. This figure approximates the entire Federal Budget prior to 1933.

Each year—

- — more than a billion individual letters are written, costing $1 billion
- — $180 million is spent on office space for paper work employees, plus $40 million for records storage space
- — rental of tabulating machines comes to $36 million
- — 9 billion documents are added to the government's "permanent" records

The cost of paper work today is 5 times the amount of the total federal expenditures in 1912, when the Taft Commission surveyed the ordinary business processes of government. Paper work activity reflects the enormous growth of the Federal Government.

In the last 22 years—

- — the number of federal civilian employees grew from 583,000 to about 2,300,000
- — the number of federal agencies increased from 570 to 2,135
- — federal administrative expenses (excluding loans) mushroomed from $3.5 billion to about $67 billion

Considering all of these examples and facts—I am sure you will agree that we must have not more records but more Records Management. And don't forget that through automation, electronics, and data processing, we can create more information, and do it faster, which in turn will feed the appetite for more and more records, and result in a larger amount of records-keeping.

We, in business, must take stock of our records problems or we may be buried under this avalanche of paper work.

Solution Available

I have been talking about how we got into this mess and what kind of a mess we are in. Now let me give you some ideas of what to do about it.

1. Study the use of your records. Where are they located and what is the frequency of use.
2. Establish a uniform system of filing that will sort out duplications from original documents, one that will require minimum personnel for maximum effort, and minimum space for maximum records needs.
3. Establish a sound Records Retention Schedule—one that is realistic and not pessimistic. Remember that a calculated risk must be taken. You can not save to cover every eventuality.
4. Design your Central Records Center or Archives on a low-cost quick reference basis. Keep in mind this must operate efficiently so that people will have confidence in the Center. If they are not confident that they will secure documents when needed, both the system and Center will bog down. People are "string savers"—why? Because they feel they might not be able to get the information when they need it; hence, everything is kept in duplicate and filed at the right hand.
5. Designate the responsibility for creating records, and the authority of controlling them after they are created.
6. Records are meant to be a business history. Determine what history you need for a functional operation of your business.
7. Study each and every file and records operation with the idea of creating a "Business Memory" system at the lowest cost.
8. Be sure that your retention and destruction program has allowed for legal and governmental regulations. Extract all valuable information before you destroy your records.
9. Study your personnel standards for these departments. Be certain that you are employing qualified people to administer your records work. Remember, of course, that for qualified people you must pay accordingly. People who are efficient in the field of filing and records administration are specialists, and you will get only what you pay for.
10. Be sure that your programs, when instituted, have the cooperation of top management. Start from the top and work down and you will find that the employees will go along with your streamlined procedures.

These are 10 points that I think will help you harness what I call the "Paper Monster." Most of all, make the supreme effort to institute realistic systems, and then insist that they be applied.

Where Do We Go From Here?

One of the reasons for this records dilemma is that time and effort are involved. Management is busy running a business; employees are busy carrying out their duties of everyday work. No one has the time, and in many cases the training, to review the records program and institute a long range, streamlined, paper work control system. So, in many organizations, they go on and on living in the "dark ages."

One of the most practical solutions, of course, is to engage an outside consulting firm to study your system, and put a well-organized, planned program into effect. This, of course, insures that the work will be completed within a prescribed time, in the most economical manner, and by skilled records technicians.

There are no short-cuts or utopias in paper work. You must start at the beginning and continue on a planned outline until you have reached your goal. Certainly, there is an expenditure; however, in most instances, the cost is returned within the first 6 months, and then compounded many times over during the succeeding years.

Let me cite an example of the monetary return to one of our clients.

We were asked to revise the records of the City of Chicago, Building Department, Inspection Files. A study showed that by changing the system, purging old records, installing shelf filing equipment, a definite control on an economical basis would result. The changes were approved, the work was started, and these results were attained:

- 40 per cent reduction of records through a planned weeding or purging process
- 228 per cent capacity of material in the same space by using shelf filing
- complete control of vital records at all times
- centralized records with efficiency in operation
- approximate saving of $32,435 the first year
- approximate saving of $27,303 annually thereafter
- total cost of $9,368

This is just one more instance of Controlling the "Paper Monster" through planned Records Management.

Before I conclude, I would like to relate one more instance where not enough thought and planning was a costly mistake. You recall the devastating floods that occur periodically throughout the country. Most of us assume that records are protected in times of disaster because of proper equipment, location of records, and prearranged plans in the event of disaster. Well, let me remind you, statistics show that one of the most costly and devastating blows to businesses during floods, are management's vital records kept in executive's individual desks. These have no protection and yet, when businesses try to resume operations, these are the records needed most. Here again, I repeat, a records program is not just for the employees, but for management as well. The place to start is at the top where the truly vital records are created and maintained.

Conclusion

Now let me conclude these remarks by reminding you that all records are created by people and used by people. Differences in personalities, as well as peculiarities of industries, naturally affect records-keeping systems. The purpose of a records-keeping system is not to please experts, but to present facts in an understandable form to the people who are to use them. Since no two businesses operate exactly alike, a system which is best for one company may not be the best for another. As long as variations in the files and records remain within the bounds dictated by common sense and sound records-keeping practices, each organization will reap the profits of paper work control.

Records Management has become a practical science designed to help industry and government. It has demonstrated its capacity to improve paper work operations, by promoting standards of quantity, cost and quality.

Records Management is filling the need for better business histories, and business "Memory Systems."

Every alert executive and administrator should be investigating these potentials for profit to his own organization.

WHY—RECORDS MANAGEMENT?
TO CONTROL THE "PAPER MONSTER!!"

I come in contact with records administration everyday. I see first hand the tremendous need for it and then the impressive results of it. I really get enthused when I have the opportunity to present this story of Controlling the "Paper Monster," this story of cost savings to others.

Dr. Oliver Bowles

Dr. Oliver Bowles, internationally known expert in the field of non-metallic minerals, passed away recently at his home in Virginia. An employee of the United States Bureau of Mines for over 44 years, Dr. Bowles served as Chief of the Non-Metal Economics Branch of the Economics and Statistics Division from 1942 until his retirement in 1948. He was the author of numerous professional articles and authoritative texts familiar to crushed stone producers everywhere. The Department of Interior recognized Dr. Bowles in 1948 by granting him its Distinguished Service Award.

Crushed and Broken Stone in 1957

By WALLACE W. KEY
NAN C. JENSEN

Under the Supervision of G. W. Josephson
Chief, Branch of Construction and Chemical Materials, Division of Minerals
United States Bureau of Mines
Washington, D. C.

A NEW crushed stone production record was established again in 1957. Total output in 1957 as reported to the Bureau of Mines, United States Department of the Interior, reached a new high of 536 million short tons valued at $746 million, compared with 504 million tons valued at $689 million in 1956.

As in previous years, the production in 1957 included crushed stone used for concrete aggregate, roadstone, cement, lime, metallurgical flux, railroad ballast, refractory stone, agricultural limestone, abrasives, and riprap, and in various chemical and other manufacturing processes. Asphaltic stone and slate granules and flour are excluded in this total, but nearly 2 million tons of calcareous marl, valued at $1.8 million, for use in cement manufacture and agricultural applications were included.

Over half the production of crushed and broken stone went into concrete and roadstone applications in 1957. Nearly 90 per cent of the aggregates produced for these purposes came from commercial operations. The federal highway program, which was in an early stage, began to absorb substantial tonnages as did a number of dam construction projects. Consequently the production of "concrete and roadstone" increased nearly 10 per cent over 1956.

(*Continued on Page 22*)

CRUSHED AND BROKEN STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES,[1] 1956-57, BY PRINCIPAL USES

Uses	1956			1957		
	Thousand short tons	Value		Thousand short tons	Value	
		Total (thousand dollars)	Average per ton		Total (thousand dollars)	Average per ton
Concrete and roadstone	276,269	369,883	$1.34	302,754	414,114	$1.37
Railroad ballast	15,481	16,545	1.07	16,581	18,019	1.09
Portland and natural cement [2]	86,452	91,604	1.06	79,944	84,071	1.05
Furnace flux (limestone)	37,789	52,486	1.39	39,384	56,113	1.42
Agricultural limestone	19,864	32,087	1.62	[3] 19,206	[3] 31,556	1.64
Lime and dead-burned dolomite [4]	17,495	24,028	1.37	17,162	25,780	1.50
Riprap	13,134	15,565	1.19	14,462	17,699	1.22
Alkali works	5,723	5,965	1.04	4,899	4,551	.93
Refractory [5]	1,436	11,054	7.70	1,734	11,930	6.88
Asphalt filler	1,613	3,592	2.23	2,054	5,343	2.60
Glass factories	987	2,928	2.97	1,204	3,589	2.98
Calcium carbide works	1,245	1,060	.85	857	839	.98
Sugar factories	725	1,750	2.41	780	1,866	2.39
Paper mills	518	1,454	2.80	504	1,356	2.69
Other uses	24,983	59,218	2.37	34,918	69,453	1.99
Total	503,714	689,219	1.37	536,443	746,279	1.39

[1] Includes territories of the United States, possessions, and other areas administered by the United States
[2] Limestone, cement rock, shell, and calcareous marl
[3] Limestone and calcareous marl
[4] Limestone, dolomite, and shell
[5] Ganister (sandstone and quartzite) and dolomite

STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1956–57, BY STATES

State	1956		1957	
	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)
Alabama	[1] 12,343	[1] 14,702	[1] 9,519	[1] 11,972
Arizona	1,623	2,474	2,101	2,982
Arkansas	6,325	8,113	7,278	8,378
California	32,583	46,109	41,351	53,591
Colorado	2,250	5,217	2,438	4,168
Connecticut	[1] 4,428	[1] 6,590	6,199	10,040
Delaware	83	232	[2]	[2]
Florida	18,779	25,183	21,786	30,467
Georgia	[1] 9,196	[1] 20,714	[1] 9,065	[1] 15,833
Idaho	1,791	2,752	1,542	2,759
Illinois	31,855	40,859	31,861	41,835
Indiana	14,700	31,575	14,460	33,094
Iowa	14,035	17,256	15,214	18,768
Kansas	[1] 13,433	[1] 15,682	[1] 10,664	[1] 12,342
Kentucky	11,553	15,324	12,718	16,714
Louisiana	4,405	6,674	4,383	7,152
Maine	942	2,238	889	3,076
Maryland	6,229	13,305	6,140	13,392
Massachusetts	5,442	13,753	4,877	13,165
Michigan	33,999	31,010	34,495	34,176
Minnesota	[1] 3,084	[1] 7,552	[1] 2,968	[1] 8,175
Mississippi	656	656	[1] 60	[1] 54
Missouri	24,578	33,577	22,098	29,836
Montana	1,247	1,816	2,567	3,654
Nebraska	3,063	4,142	3,065	3,749
Nevada	1,401	2,281	925	1,585
New Hampshire	[2]	[2]	[2]	[2]
New Jersey	9,012	20,825	8,792	21,222
New Mexico	1,268	1,272	1,348	1,618
New York	22,805	36,135	24,265	43,276
North Carolina	[1] 8,352	[1] 11,472	[1] 9,455	[1] 12,839
North Dakota	83	87	29	52
Ohio	[1] 33,418	[1] 50,947	[1] 37,451	[1] 61,847
Oklahoma	10,547	12,417	12,016	14,064
Oregon	6,098	7,890	10,311	11,405
Pennsylvania	[1] 44,913	[1] 73,831	43,258	73,090
Rhode Island	[1] 42	[1] 221	[1] 4	[1] 14
South Carolina	[1] 3,304	[1] 4,285	[1] 3,413	[1] 4,581
South Dakota	2,200	5,725	1,718	5,068
Tennessee	[1] 15,556	[1] 23,796	[1] 15,354	[1] 24,155
Texas	32,773	36,350	30,660	35,358
Utah	2,322	3,298	7,854	8,540
Vermont	621	11,622	557	11,404
Virginia	14,082	23,076	[1] 14,244	[1] 21,158
Washington	8,057	11,660	8,454	10,600
West Virginia	6,579	10,766	6,989	11,934
Wisconsin	11,126	20,402	12,434	22,455
Wyoming	1,333	2,076	1,291	2,266
Undistributed	5,193	17,266	9,815	27,705
Total	499,707	755,205	528,375	805,608
Alaska	195	595	528	1,953
American Samoa	2	6	34	37
Canton Island	2	5		
Guam	341	311	1,034	1,132
Hawaii	3,494	6,076	2,585	4,632
Midway Island	203	304	3,875	6,700
Panama Canal Zone	177	230	59	99
Puerto Rico	2,076	2,556	2,452	3,505
Virgin Islands	12	32	11	31
Wake Island	22	22	5	6
Total	6,524	10,137	10,583	18,095
Grand Total [3]	506,231	765,342	538,958	823,703

[1] To avoid disclosure of individual company confidential data, certain state totals are incomplete, the portion not included being combined with "Undistributed." The Class of stone omitted from such state totals is noted in the state tables in the Statistical Summary chapter of the Minerals Yearbook
[2] Figure withheld to avoid disclosing individual company confidential data; included with "Undistributed"
[3] Includes: 1956—2,517 thousand short tons of dimension stone valued at $76,123 thousand; 1957—2,515 thousand short tons, $77,424 thousand

CRUSHED STONE SOLD OR USED IN THE UNITED STATES [1] IN 1957, BY METHODS OF TRANSPORTATION

Method of transportation	Commercial operations		Commercial and noncommercial [2] operations	
	Thousand short tons	Per cent of total	Thousand short tons	Per cent of total
Truck	270,556	56	325,765	61
Rail	96,562	20	96,562	18
Waterway	56,893	12	56,893	10
Unspecified	57,223	12	57,223	11
Total	481,234	100	536,443	100

[1] Includes territories of the United States, possessions, and other areas administered by the United States
[2] Entire output of noncommercial operations assumed to be moved by truck

LIMESTONE AND DOLOMITE (CRUSHED AND BROKEN STONE) SOLD OR USED BY PRODUCERS IN THE UNITED STATES,[1] 1956–57, BY USES

Use	1956		1957	
	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)
Riprap	7,503	8,153	5,369	5,919
Fluxing stone	37,789	52,487	39,384	56,113
Concrete and roadstone	189,081	242,956	202,312	266,178
Railroad ballast	7,479	8,569	8,365	9,966
Agriculture	19,864	32,087	18,941	31,398
Alkali works	5,723	5,965	4,899	4,551
Calcium carbide works	1,245	1,060	857	839
Cement—Portland and natural	81,008	85,230	73,592	77,191
Coal-mine dusting	497	1,955	565	2,231
Filler (not whiting substitute):				
Asphalt	1,613	3,592	2,054	5,343
Fertilizer	406	818	345	718
Other	506	1,884	541	2,162
Filter beds	95	161	120	234
Glass factories	954	2,763	1,204	3,589
Lime and dead-burned dolomite	16,850	23,338	17,162	25,780
Limestone sand	2,560	3,433	2,311	3,054
Limestone whiting [2]	711	6,129	809	6,019
Magnesia works (dolomite) [3]	248	751	143	406
Mineral food	443	2,651	453	2,657
Mineral (rock) wool	12	17	7	8
Paper mills	518	1,454	504	1,356
Poultry grit	164	965	129	825
Refractory (dolomite)	266	446	539	1,162
Road base	267	218	130	130
Sugar factories	725	1,750	780	1,866
Other uses [4]	1,606	4,567	1,764	3,784
Use unspecified	1,209	1,704	1,015	1,488
Total	379,342	495,103	384,294	514,967

[1] Includes Hawaii and Puerto Rico
[2] Includes stone for filler for calcimine, caulking compounds, ceramics, chewing gum, explosives, floor coverings, foundry compounds, glue, grease, insecticides, leather goods, paint, paper, phonograph records, picture-frame moldings, plastic, pottery, putty, roofing, rubber, toothpaste, wire coating, and unspecified uses. Excludes limestone whiting made by companies from purchased stone
[3] Includes stone for refractory magnesia
[4] Includes stone for acid neutralization, carbon dioxide, chemicals (unspecified), concrete blocks and pipes, dyes, electric products, fill material, litter and barn snow, oil-well drilling, patching plaster, rayons, rice milling, roofing granules, silicones, spalls, stucco, terrazzo, artificial stone, target sheets, and water treatment

CRUSHED AND BROKEN STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES,[1] 1943–57, BY USES

Year	Riprap		Concrete and roadstone		Railroad ballast		Fluxing stone (limestone)	
	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)
1943	4,950	4,835	82,412	83,398	17,236	11,346	31,570	24,506
1944	4,011	4,948	64,796	66,144	18,285	12,557	31,080	25,130
1945	4,801	5,590	64,108	65,536	21,265	14,894	27,639	22,076
1946	3,848	5,010	90,359	97,765	16,908	13,127	25,158	20,792
1947	5,733	6,514	107,078	125,753	16,350	13,567	32,570	28,688
1948	5,707	7,553	121,619	150,017	18,181	16,316	34,902	34,250
1949	7,568	9,830	124,367	158,358	17,054	15,377	30,752	32,268
1950	6,898	7,807	146,496	191,534	18,614	17,519	35,970	37,932
1951	6,989	8,438	168,766	216,418	21,368	20,337	39,930	45,622
1952	8,779	11,156	187,114	245,977	21,383	20,019	34,909	41,119
1953	7,735	10,053	189,159	251,515	20,778	20,533	40,881	53,041
1954	7,642	10,979	216,614	289,442	15,173	14,871	33,162	40,934
1955	10,286	13,680	254,588	336,260	15,871	16,758	40,068	52,906
1956	13,134	15,565	276,269	369,883	15,481	16,545	37,789	52,486
1957	14,462	17,699	302,754	414,114	16,581	18,019	39,384	56,113

Year	Refractory		Agriculture (limestone)		Other uses		Total	
	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)	Thousand short tons	Value (thousand dollars)
1943	2,708	4,577	14,522	19,057	17,113	23,234	170,511	170,953
1944	2,314	3,922	18,941	25,316	15,534	22,770	154,961	160,787
1945	2,527	4,545	17,396	25,892	14,610	22,926	152,346	161,459
1946	2,088	4,157	22,782	32,483	16,335	28,033	177,478	201,367
1947	2,704	5,537	22,605	35,076	19,096	33,317	206,136	248,452
1948	2,557	6,531	20,942	32,035	20,033	34,396	223,941	281,098
1949	1,828	5,764	21,483	33,251	19,356	34,848	222,408	289,696
1950	2,158	5,849	19,349	30,393	20,158	40,323	249,643	331,357
1951	2,366	7,810	19,401	31,052	24,869	46,982	283,689	376,659
1952	1,951	7,262	21,152	34,464	24,412	48,769	299,700	408,766
1953	1,937	8,079	18,428	30,104	25,975	50,693	304,893	424,018
1954	1,078	5,191	18,247	30,199	[2] 117,762	[2] 155,821	[2] 409,678	[2] 547,437
1955	1,169	5,778	18,360	29,455	[2] 127,616	[2] 177,465	[2] 467,958	[2] 632,302
1956	1,436	11,054	19,864	32,087	[2] 139,741	[2] 191,599	[2] 503,714	[2] 689,219
1957	1,734	11,930	[3] 19,206	[3] 31,556	[2] 142,322	[2] 196,848	[2] [3] 536,443	[2] [3] 746,279

[1] Includes territories of the United States, possessions, and other areas administered by the United States. 1943–53 excludes ground sandstone, quartz, and quartzite used for abrasives and other uses; shell for various uses; and limestone, cement rock, and dolomite used in making cement, lime, and dead-burned dolomite.

[2] Includes the following quantities of limestone, cement rock, shell, calcareous marl, and dolomite used in making cement, lime, and dead-burned dolomite: 1954—88,796 thousand tons valued at $95,471 thousand; 1955—100,618 thousand tons, $111,405 thousand; 1956—103,947 thousand tons, $115,632 thousand; 1957—97,106 thousand tons, $109,851 thousand. Also includes ground sandstone, quartz, quartzite, and shell used for miscellaneous purposes.

[3] Includes calcareous marl for agricultural use.

(*Continued from Page 19*)

Portland and natural cement production consumed 15 per cent of the total crushed and broken stone in 1957, a decrease of 8 per cent in tonnage compared with 1956. Limestone and calcareous marl used in agriculture accounted for 4 per cent of the total tonnage. In addition, a small quantity of shell was used in agriculture. Furnace flux accounted for 10 per cent of the total limestone produced in 1957 and increased 4 per cent in quantity and 7 per cent in value over 1956.

Limestone and dolomite constituted 72 per cent of the total sales in 1957 and was quarried in 44 states and 2 territories.

The foregoing tables present the salient statistics of the crushed and broken stone industry for 1956 and 1957.

CRUSHED AND BROKEN STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES [1] IN 1957, BY KINDS AND PRINCIPAL USES

Kind of stone	Concrete and roadstone		Railroad ballast		Riprap		Agriculture	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Granite	27,944,059	$39,061,158	1,829,550	$1,947,190	1,257,055	$2,038,185		
Basalt [2]	35,352,640	59,290,827	2,247,255	3,345,082	4,644,857	5,113,672		
Marble	(3)	(3)					(3)	(3)
Limestone	202,312,084	266,178,184	8,364,568	9,965,528	5,369,544	5,919,455	18,941,235	$31,397,800
Shell	11,334,061	16,720,410	(3)	(3)			(3)	(3)
Calcareous marl							264,841	158,527
Sandstone, quartz, and quartzite	9,350,674	12,165,180	416,023	564,586	2,208,569	3,362,991		
Miscellaneous [4]	16,460,302	20,697,967	3,723,845	2,196,537	981,885	1,265,104		
Total	302,753,820	414,113,726	16,581,241	18,018,923	14,461,910	17,699,407	19,206,076	31,556,329

Kind of stone	Fluxing stone		Refractory stone		Other uses		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Granite					10,066,260	$6,496,508	41,096,924	$49,543,041
Basalt [2]					840,563	3,387,320	43,085,315	71,136,901
Marble					1,274,004	9,634,379	1,274,004	9,634,379
Limestone	39,384,087	$56,113,124	538,498	$1,161,994	109,384,458	144,231,075	384,294,474	514,967,160
Shell					7,176,074	10,047,128	18,510,135	26,767,538
Calcareous marl					1,651,620	1,645,725	1,916,461	1,804,252
Sandstone, quartz, and quartzite	(3)	(3)	1,195,770	10,767,536	2,567,562	10,377,959	15,738,598	37,238,252
Miscellaneous [4]					9,361,288	11,027,664	30,527,320	35,187,272
Total	39,384,087	56,113,124	1,734,268	11,929,530	142,321,829	196,847,758	536,443,231	746,278,795

[1] Includes territories of the United States, possessions, and other areas administered by the United States
[2] Includes gabbro, diorite, and other dark igneous rocks commercially classified as traprock
[3] A small quantity included with "Other uses"
[4] Includes conglomerates, argillite, various light-color volcanic rocks, schists, serpentine, flint, and chats

Capital Expenditures for Highways Increase

CAPITAL expenditures for highways by all units of government are expected to reach $6.2 billion in the calendar year 1958, according to Bertram D. Tallamy, Federal Highway Administrator. This is an increase of $500 million or 10 per cent above the 1957 total of $5.7 billion. The U. S. Department of Commerce's Bureau of Public Roads, which Mr. Tallamy heads, also forecast that annual capital expenditures will reach $7.1 billion in 1959, $7.3 billion in 1960, $7.7 billion in 1961, and $8.1 billion in 1962.

During the 5 years 1958-62, federal-aid funds are expected to provide a rapidly increasing share of the total capital expenditures: 29 per cent in 1958, 40 per cent in 1959 as the expanded federal-aid program gets in high gear, and a gradual increase to 42 per cent as the program stabilizes. The rate of increase in federal-aid funds is influenced favorably by the additional $600 million provided in the Federal Highway Act of 1958 for expenditure during 1958 and 1959, and through the temporary suspension, by that act, of the pay-as-you-go clause in the 1956 Highway Act, which otherwise would have required a severe curtailment of expenditures early in 1960 to avoid creating a deficit in the Highway Trust Fund.

Funds available to the States for capital expenditures for highways, both for matching federal-aid and for non-federal-aid free roads, are expected to increase from $2.6 billion in 1958 to $3.1 billion in 1962. The funds required to match federal aid are expected to rise from $944 million in 1958 to $1.1 billion in 1962. Capital expenditures by the States in non-federal-aid work are expected to grow from $1.7 billion to $2.0 billion in the same period.

Capital expenditures by local governments (counties, towns and townships, cities, road districts, etc.), based on past trends, are projected to increase from $1.1 billion in 1958 to $1.3 billion in 1962.

(*Continued on Page 24*)

E. L. Armstrong Named Public Roads Commissioner

SECRETARY OF COMMERCE Sinclair Weeks has announced the appointment of Ellis L. Armstrong of Salt Lake City as Commissioner of the Bureau of Public Roads, U. S. Department of Commerce.

Mr. Armstrong, presently Director of Highways for the State of Utah, will take office early in October, becoming second in command to Federal Highway Administrator Bertram D. Tallamy in administering the vast federal-aid highway program in the U. S. and its territories.

The post of Commissioner has been open since the retirement, after 38 years of service with the Bureau, of Charles D. Curtiss. Since that time Mr. Tallamy's chief assistant has been Deputy Commissioner and Chief Engineer Francis C. Turner.

Mr. Armstrong agreed not to take office immediately so that the Utah State Road Commission would have time to seek a successor.

"I am greatly pleased that Mr. Armstrong has consented to accept this very important appointment," Secretary Weeks said. "We made a nationwide search to find an outstanding engineer to assist Mr. Tallamy in administering the multimillion dollar federal highway program. I am convinced that we have found the right man and that he will be of invaluable help to us in continuing the program on schedule."

Mr. Armstrong, 44, was born in Cedar City, Utah, and was graduated from Utah State University in 1936 with the degree of Bachelor of Science in Civil Engineering. He did post graduate work there and at Colorado A. & M.

A specialist on heavy construction, Mr. Armstrong was a design and construction engineer with the U. S. Bureau of Reclamation from 1936 until 1953.

Among other projects, he was in charge of construction of the $23 million Trenton Dam in southwestern Nebraska. He also was field and office engineer in the construction of the Anderson Ranch Dam in southern Idaho with the highest earth fill in the world.

In 1953 he was loaned to the Department of State for assignment to Egypt as a special consultant on the High Aswan Dam. Subsequently he became project engineer on the St. Lawrence River power project with private consultants for the New York State Power Authority.

Although his principal activity has been concerned with heavy earth work, embankments, dams, and excavation, all of the projects involved a great deal of highway design and construction.

In May 1957, he was appointed Director of Highways for the State of Utah and has been directly in charge of administering the greatly expanded highway program in that State.

He is a member of the American Society of Civil Engineers, the American Association of State Highway Officials, the United States Committee on Large Dams, Rotary, and other organizations.

Mr. Armstrong has contributed many articles on earth dam design and construction to technical journals and has given a series of graduate study lectures on the subject at Colorado University.

Capital Expenditures for Highways Increase

(*Continued from Page 23*)

Notable is the expected rapid decline in annual capital expenditures for toll facilities, from $500 million in 1958 to $75 million in 1962. An average of nearly $1 billion was expended annually in 1955-57 for toll facilities. The anticipated decline is, of course, largely due to the advent of the expanded Interstate System program, which will include most of the roads that otherwise might be considered economically sound for toll financing.

Federal capital expenditures for roads in national forests, parks, and other federal lands are expected to increase modestly from $153 million in 1958 to $163 million in 1962.

Preliminary engineering and right-of-way acquisition costs represent an appreciable part—roughly 1/5—of the total capital expenditures for highways. Construction expenditures, forecast as rising from $5.1 billion in 1958 to $6.9 billion in 1962, are expected to account for 83 per cent of the total capital expenditures in 1958. It is anticipated that they will drop to 80 per cent in 1960, and then rise to 85 per cent by 1962.

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Division Goodman Manufacturing Co.

Halsted Street & 48th Place, Chicago 9, Ill.

Jaw and Roll Crushers; Vibrator, Revolving, and Scrubber Screens; Drag Washers; Bucket Elevators; Belt Conveyors; Bins; Apron and Plate Feeders; Portable Gravel and Rock Crushing, Screening, and Washing Plants; Stationary Crushing, Screening, and Washing Plants; Hammermills

Drill Carrier Corp.

P. O. Box 628, Salem, Va.

"Air-Trac" Drill Carrier

Du Pont of Canada Limited

85 Eglinton Ave. E., Toronto 12, Ont., Canada

Explosives and Blasting Supplies

Du Pont, E. I., de Nemours & Co.

Wilmington 98, Del.

Explosives and Blasting Supplies

Dustex Corp.

1758 Walden Ave., Buffalo 25, N. Y.

Dust Collecting Equipment; Dust Control Systems; Feeders

Manufacturers Division – National Crushed Stone Association
(continued)

Eagle Crusher Co., Inc.

900 Harding Way East, Galion, Ohio

Crushers; Pulverizers; Hammermills; 4-Cage Disintegrating Mills

Eagle Iron Works

P. O. Box 934, Des Moines 4, Iowa

Fine Material Screw Washers—Classifiers—Dehydrators; Coarse Material Screw and Log Washers—Dewaterers; Water Scalping and Fine Material Settling Tanks; Drop Balls—Ni-Hard and Semi-Steel; "Swintek" Screen Chain Cutter Dredging Ladders; Revolving Cutter Head Dredging Ladders

Easton Car & Construction Co.

Easton, Pa.

Off-Highway Transportation: Quarry Hauling Systems—Heavy-Duty Dump Trailers, Truck Bodies, and Cars for Mines, Quarries, and Earth Moving

Electric Steel Foundry Co.

2141 N. W. 25th Ave., Portland 10, Oreg., and 1017 Griggs St., Danville, Ill.

Esco Dragline Buckets, Shovel Dippers, Bucket Teeth, Crusher Wearing Parts, Cutting Edges and End Bits

Ensign-Bickford Co.

Hopmeadow St., Simsbury, Conn.

Primacord-Bickford Detonating Fuse and Safety Fuse

Euclid Division
General Motors Corp.

1361 Chardon Road, Cleveland 17, Ohio

Heavy-Duty Trucks and Dump Trailers for "Off-Highway" Hauls, Loaders for Earth Excavation, Single and Twin Engine Earth Moving Scrapers, Crawler Tractors

Frog, Switch & Mfg. Co.
Manganese Steel Department

Carlisle, Pa.

"Indian Brand" Manganese Steel Castings for all Types of Jaw, Gyratory, and Pulverizing Crushers; Dippers, Teeth, Treads, and Other Parts for Power Excavating Equipment; and Other Miscellaneous Manganese Steel Castings. Manufacturers and Fabricators of Railroad and Mine Frogs, Switches, and Crossings

Gardner-Denver Co.

South Front St., Quincy, Ill.

Portable and Stationary Compressors, Rock Drills, "Air-Tracs," Self-Propelled Drills, Sectional Drill Rods and Accessories, Air Hoists, Slusher Hoists, "Mole-Drills," Paving Breakers, Drill Steel, Gads, Etc.

General Electric Co.

1 River Road, Schenectady 5, N. Y.

Electric Motors, Controls, Locomotives, Coordinated Electric Drives for: Shovels, Drag Lines, Conveyors, Hoists, Cranes, Crushers, Screens, Etc.; Coordinated Power Generating and Distributing Systems Including Generators, Switchgear, Transformers, Cable, Cable Skids, Load Center Substations; Speed Reducers

Gill Rock Drill Co., Inc.

Lebanon, Pa.

Well Drill Tools and Supplies

Gilson Screen Co.

110 Center St., Malinta, Ohio

Testing Screens and Accessories for Test Sizing of Concrete Aggregates

Goodrich, B. F., Industrial Products Co.

500 South Main St., Akron, Ohio

Belting—Conveyor and V-Belts, Hose, and Industrial Rubber Products

Goodyear Tire & Rubber Co., Inc.

Akron 16, Ohio

Airfoam; Industrial Rubber Products—Belting (Conveyor, Elevator, Transmission), Hose (Air, Water, Steam, Suction, Miscellaneous); Chute Lining (Rubber); Rims (Truck and Tractor); Storage Batteries (Automobile, Truck, Tractor); Tires (Automobile, Truck, Off-the-Road); Tubes (Automobile, Truck, Off-the-Road, LifeGuard, Safety Tubes, Puncture Seal Tubes)

Gulf Oil Corp.
Gulf Refining Co.

Gulf Bldg., Seventh Ave., Pittsburgh 19, Pa.

Lubricating Oils, Greases, Gasoline and Diesel Fuels

Haiss, George, Mfg. Co., Inc.
Division of Pettibone Mulliken Corp.

4700 West Division St., Chicago 51, Ill.

Bucket Loaders, Buckets, Portable and Stationary Conveyors, Car Unloaders

Manufacturers Division – National Crushed Stone Association
(continued)

Harnischfeger Corp.

4400 West National Ave., Milwaukee 46, Wis.

A Complete Line of Power Cranes, Shovels, Draglines, Overhead Cranes, Hoists, Welders, Electrodes, Motors and Generators, Diesel Engines

HarriSteel Products Co.

420 Lexington Ave., New York 17, N. Y.

Woven Wire Screen Cloth

Hayward Co.

50 Church St., New York 7, N. Y.

Orange Peel Buckets, Clam Shell Buckets, Electric Motor Buckets, Automatic Take-up Reels

Heidenreich, E. Lee, Jr.
Consulting Engineers

75 Second St., Newburgh, N. Y.

Plant Layout, Design, Supervision; Open Pit Quarry Surveys; Appraisals — Plant and Property

Hendrick Mfg. Co.

Carbondale, Pa.

Perforated Metal Screens, Perforated Plates for Vibrating, Shaking, and Revolving Screens; Elevator Buckets; Test Screens; Wedge Slot Screens; Wedge Wire Screens; Open Steel Floor Grating

Hercules Powder Co.

Wilmington 99, Del.

Explosives and Blasting Supplies

Hetherington & Berner, Inc.

701-745 Kentucky Ave., Indianapolis 7, Ind.

Asphalt Paving Machinery, Sand and Stone Dryers

Hewitt-Robins Incorporated

666 Glenbrook Road, Stamford, Conn.

Belt Conveyors (Belting and Machinery); Belt and Bucket Elevators; Car Shakeouts; Feeders; Industrial Hose; Screen Cloth; Sectional Conveyors; Skip Hoists; Stackers; Transmission Belting; Vibrating Conveyors, Feeders, and Screens; Design and Construction of Complete Plants; Molded Rubber Goods; Sheet Packing; Transmission Belting; Dewaterizers; Wire Conveyor Belts; Speed Reducers; Gears; Pulleys; Sheaves; Couplings

Howe Scale Co.

Strongs Ave., Rutland, Vt.

Scales, Static Weighing and Motion Weighing Devices, Automatic Batching Equipment

Hoyt Wire Cloth Co.

P. O. Box 22, Lancaster, Pa.

Aggregate Wire Screens Made of Supertough, Abraso, and Stainless Steel Wire—Smooth-top, Longslot, Oblong Space and Double Crimp Construction—For All Makes of Vibrators; Rubber Bucker Up Channel

Hughes Tool Co.

P. O. Box 2539, Houston 1, Texas

Bits—Rotary Rock

Ingersoll-Rand Co.

11 Broadway, New York 4, N. Y.

Rock Drills, Paving Breakers, Paving Breaker Accessories, Quarrymaster Drills, Drillmasters, Waterwell Drills, Down-Hole Drills, Carset Bits, Jackbits, Bit Reconditioning Equipment, Portable and Stationary Air Compressors, Air Hoists, Slusher Hoists, Pneumatic Tools, Centrifugal Pumps, Diesel and Gas Engines

Insley Manufacturing Corp.

P. O. Box 167, Indianapolis 6, Ind.

1/2 to 1 Cu. Yd. Cranes and Shovels 5 to 35 Ton Capacity with Rubber or Crawler Mounting; Crane Mountings Including Trucks, Self-Propelled Rubber-Tired Carriers and Crawlers; Concrete Buckets, Carts, and Hoppers

International Harvester Co.
Construction Equipment Division

P. O. Box 270, Melrose Park, Ill.

Tractors (Crawlers) and Equipment; Off-Highway Trucks; Power Units—Carbureted and Diesel

Iowa Manufacturing Co.

916 16th St., N. E., Cedar Rapids, Iowa

Rock and Gravel Crushing, Screening, Conveying and Washing Plants, Asphalt Plants, Stabilizer Plants, Impact Breakers, Screens, Elevators, Conveyors, Portable and Stationary Equipment, Hammermills, Bins

Manufacturers Division – National Crushed Stone Association
(continued)

Jaeger Machine Co.
550 West Spring St., Columbus 16, Ohio
Portable and Stationary Air Compressors, Self-Priming Pumps, Truck Mixers, Concrete Mixers, Road Paving Machinery, Hoists and Towers; Finishers—Concrete, Spreaders—Stone and Concrete

Jeffrey Manufacturing Co.
815 North Fourth St., Columbus 16, Ohio
Elevator Buckets; Car Pullers; Chains; Conveyors: Belt, Drag, Apron, Vibrating; Idlers; Crushers; Pulverizers; Elevators; Feeders, Pillow Blocks; Grizzlies; Screens

Johnson-March Corp.
1724 Chestnut St., Philadelphia 3, Pa.
Dust Control Engineers, Chem-Jet Dust Control Systems, Gas Scrubbers

Joy Manufacturing Co.
333 Henry W. Oliver Bldg., Pittsburgh 22, Pa.
Drills: Blast-Hole, Wagon, Rock, and Core; Air Compressors: Portable, Stationary, and Semi-Portable; Aftercoolers; Portable Blowers; Carpullers; Hoists: Multi-Purpose and Portable; Rock Loaders; Air Motors; Trench Diggers; Belt Conveyors; "Spaders;" "String-a-Lite" (Safety-Lighting-Cable); Backfill Tampers; Drill Bits: Rock and Core; Joy Microdyne Dust Collectors; Shovel Loaders

Kennedy-Van Saun Mfg. & Eng. Corp.
2 Park Ave., New York 16, N. Y.
Crushing, Screening, Washing, Conveying, Elevating, Grinding, Complete Cement Plants, Complete Lime Plants, Complete Lightweight Aggregate Plants, Synchronous Motors, Air Activated Containers for Transportation of Pulverized Material, Cement Pumps, and Power Plant Equipment

Kensington Steel
Division of Poor & Co.
505 Kensington Ave., Chicago 28, Ill.
Oro Alloy and Manganese Steel Castings: For Shovels—Dipper Teeth, Crawler Treads, Rollers, Sprockets; For Crushers—Jaw Plates, Concaves, Mantles, Bowl Liners; For Pulverizers—Hammers, Grate Bars and Liners; For Elevators and Conveyors—Chain, Sprockets, Buckets; For Tractors—Rail Links and Grouser Plates; Drag Line Chain

Koehring Division
Koehring Co.
3026 West Concordia Ave., Milwaukee 16, Wis.
Excavating, Hauling, and Concrete Equipment

Lecco Machinery & Engineering Co.
New Airport Road, Bluefield, W. Va.
Vibrating Screens and Vibrating Conveyors

Link-Belt Co.
300 West Pershing Road, Chicago 9, Ill.
Complete Stone Preparation Plants; Conveyors, Elevators, Screens, Washing Equipment, and Power Transmission Equipment

Link-Belt Speeder Corp.
1201 Sixth St., S. W., Cedar Rapids, Iowa
Complete Line of Speed-o-Matic Power Hydraulically Controlled Cranes, Shovels; Hoes, Draglines, and Clamshells, 1/2 to 3-Yd. Capacities; Available on Crawler Base or Rubber Tire Mounting; Diesel Pile Hammers

Lippmann Engineering Works, Inc.
4603 West Mitchell St., Milwaukee 14, Wis.
Primary and Secondary Rock Crushers and Auxiliary Equipment such as Feeders, Screens, Conveyors, Etc., Portable and Stationary Crushing and Washing Plants

Ludlow-Saylor Wire Cloth Co.
634 South Newstead Ave., St. Louis 10, Mo.
Woven Wire Screens of Super-Loy, Steel, Stainless Steel, and All Other Commercial Alloys and Metals

Mack Trucks, Inc.
1355 West Front St., Plainfield, N. J.
On- and Off-Highway Trucks, Tractor-Trailers, Six-Wheelers, from 5 to 100 Ton Capacity, Both Gasoline- and Diesel-Powered

Manganese Steel Forge Co.
Richmond St. & Castor Ave.,
Philadelphia 34, Pa.
ROL-MAN 11.00 to 14.00 Per Cent Rolled Manganese Steel Woven and Perforated Screens, and Fabricated Parts for Aggregate Handling Equipment

Marion Power Shovel Co.
Division of Universal Marion Corp.
617 West Center St., Marion, Ohio
Power Shovels, Draglines, Cranes, Truck Cranes—From 1/2 to 75 Yd.

Marsh, E. F., Engineering Co.
4324 West Clayton Ave., St. Louis 10, Mo.
Belt Conveyors

Manufacturers Division – National Crushed Stone Association

(continued)

Mayhew Supply Co., Inc.

4700 Scyene Road, Dallas 17, Texas

Blast Hole Drill Rigs

McLanahan & Stone Corp.

252 Wall St., Hollidaysburg, Pa.

Complete Pit, Mine, and Quarry Equipment—Crushers, Washers, Screens, Feeders, Etc., Semi-Portable Plants

Meissner Engineers, Inc.

308 West Washington St., Chicago 6, Ill.

Engineers—Constructors—Specialists in Plant Layout, Construction-Engineering Design, Procurement, Construction Management, Quarry Surveys, Plant and Property Appraisals

Mercer Rubber Co.

136 Mercer St., Hamilton Square, N. J.

Belting—Conveyor, Elevator, and Transmission; Hose—Air, Water, Steam, Suction, Sandblast, Miscellaneous; Rubber Chute Lining

Monsanto Chemical Co.
Inorganic Division

Lindbergh and Olive Street Road,
St. Louis 24, Mo.

Prilled Ammonium Nitrate

Murphy Diesel Co.

5317 West Burnham St., Milwaukee 14, Wis.

Engines—Industrial Engine, and Power Units for Operation on Diesel and Dual Fuel Engines. Generator Sets, AC and DC from 64 Kw. to 165 Kw. Mech-Elec Unit—Combination Mechanical and Electric Power Furnished Simultaneously

New York Rubber Corp.

100 Park Ave., New York 17, N. Y.

Conveyor Belting: Stonore, Dependable, and Cameo Grades; Transmission Belting: Silver Duck Duroflex, Soft Duck Rugged, Commercial Grade Tractor

Nordberg Mfg. Co.

3073 South Chase Ave., Milwaukee 7, Wis.

Symons Cone Crushers, and Symons Gyratory and Impact Crushers; Gyradisc Crushers; Grinding Mills; Stone Plant and Cement Mill Machinery; Vibrating Screens and Grizzlies; Diesel Engines and Diesel Generator Units; Mine Hoists; Railway Track Maintenance Machinery

Northern Blower Co.

6409 Barberton Ave., Cleveland 2, Ohio

Dust Collecting Systems, Fans—Exhaust and Blower

Northwest Engineering Co.

135 South LaSalle St., Chicago 3, Ill.

Shovels, Cranes, Draglines, Pullshovels—Crawler and Truck Mounted

Olin Mathieson Chemical Corp.
Explosives Division

East Alton, Ill.

Explosives, Blasting Caps, Blasting Accessories

Pennsylvania Crusher Division
Bath Iron Works Corp.

323 South Matlack St., West Chester, Pa.

Single Roll Crushers, Impactors, Reversible Hammermills, Ring Type Granulators, Kue-Ken Jaw Crushers, Kue-Ken Gyratories, Non-Clog and Standard One-Way Hammermills

Pettibone Mulliken Corp.

4710 West Division St., Chicago 51, Ill.

Tractor Shovels, Front End Loaders, Swing Loaders, Yard Cranes, Bucket and Fork Loaders, Motor Graders, Manganese Steel Castings, Material Handling Buckets, Clamshells, Draglines, Pull Shovel Dippers, Shovel Dippers, and Pumps

Pioneer Engineering
Division of Poor & Co.

3200 Como Ave., Minneapolis 14, Minn.

Jaw Crushers, Roll Crushers (Twin and Tripple), Impact Crushers, Vibrating and Revolving Screens, Feeders (Reciprocating, Apron, and Pioneer Oro Manganese Steel), Belt Conveyors, Idlers, Accessories and Trucks, Portable and Stationary Crushing and Screening Plants, Washing Plants, Mining Equipment, Cement and Lime Equipment, Asphalt Plants, Mixers, Dryers, and Pavers

Pit and Quarry Publications, Inc.

431 South Dearborn St., Chicago 5, Ill.

Pit and Quarry, Pit and Quarry Handbook, Pit and Quarry Directory, Modern Concrete, Concrete Industries Yearbook, Equipment Distributor's Digest

Manufacturers Division – National Crushed Stone Association
(continued)

Productive Equipment Corp.
2926 West Lake St., Chicago 12, Ill.
Vibrating Screens

Quaker Rubber Division
H. K. Porter Co., Inc.
Tacony and Comly Sts., Philadelphia 24, Pa.
Conveyor Belts, Hose, and Packings

Reich Bros. Mfg. Co., Inc.
1439 Ash St., Terre Haute, Ind.
Rotary and "Down-the-Hole" Drilling Machines

Rock Products
79 West Monroe St., Chicago 3, Ill.
Publications: Rock Products and Concrete Products

Rogers Iron Works Co.
11th & Pearl Sts., Joplin, Mo.
Jaw Crushers, Roll Crushers, Hammermills, Vibrating Screens, Revolving Screens and Scrubbers, Apron Feeders, Reciprocating Feeders, Roll Grizzlys, Conveyors, Elevators, Portable and Stationary Crushing and Screening Plants, Mine Hoists, Drill Jumbos, Underground Loaders, and Iron Castings

Schramm, Inc.
West Chester, Pa.
Air Compressors, Rotary Drills, Pneumatic Drills, Etc.

Screen Equipment Co., Inc.
40 Anderson Road, Buffalo 25, N. Y.
Seco Vibrating Screens; Scales—Industrial, Aggregates, Truck

Simplicity Engineering Co.
Durand, Mich.
Simplicity Gyrating Screens, Horizontal Screens, Simpli-Flo Screens, Tray Type Screens, Heavy Duty Scalpers, D'Watering Wheels, D'Centegrators, Vibrating Feeders, Vibrating Pan Conveyors, Car Shake-Outs, Woven Wire Screen Cloth, Grizzly Feeders

SKF Industries, Inc.
P. O. Box 6731, Philadelphia 32, Pa.
Anti-Friction Bearings—Self-Aligning Ball, Single Row Deep Groove Ball, Angular Contact Ball, Double Row Deep Groove Ball, Spherical Roller, Cylindrical Roller, Ball Thrust, Spherical Roller Thrust; Tapered Roller Bearings; Pillow Block and Flanged Housings—Ball and Roller

Smith Engineering Works
532 East Capitol Drive, Milwaukee 12, Wis.
Gyratory, Gyrasphere, Jaw and Roll Crushers, Vibrating and Rotary Screens, Gravel Washing and Sand Settling Equipment, Elevators and Conveyors, Feeders, Bin Gates, and Portable Crushing and Screening Plants

Soiltest, Inc.
4711 West North Ave., Chicago 39, Ill.
Laboratory and Field Testing Apparatus: Drilling and Coring Rigs, Sieve Shakers, Sieves, Scales, Balances, Calibration Equipment, Abrasion Testing Machines, Ovens and Furnaces

Sprengnether, W. F., Instrument Co., Inc.
4567 Swan Ave., St. Louis 10, Mo.
Portable Blast and Vibration Seismograph, and Scientific Instruments

Stardrill-Keystone Co.
920 East 17th St., Beaver Falls, Pa.
Drilling Machines: Rotary Air Drills, Churn Drills, Rotary Tools, Rotary Bits, Down-the-Hole Guns, Insert Type Bits, and Water Well Drills

Stedman Foundry & Machine Co., Inc.
P. O. Box 209, Aurora, Ind.
Stedman Impact-Type Selective Reduction Crushers, 2-Stage Swing Hammer Limestone Pulverizers, Multi-Cage Limestone Pulverizers, Vibrating Screens

Stephens-Adamson Mfg. Co.
Aurora, Ill.
Belt Conveyors, Pan Conveyors, Bucket Elevators, "Amsco" Manganese Steel Pan Feeders, Vibrating Screens, Belt Conveyor Carriers, Bin Gates, Car Pullers, "Sealmaster" Ball Bearing Units, "Saco" Speed Reducers, and Complete Engineered Stone Handling Plants

Taylor-Wharton Co.
Division Harsco Corp.
High Bridge, N. J.
Manganese and Other Special Alloy Steel and Iron Castings; Dipper Teeth, Fronts and Lips; Crawler Treads; Jaw and Cheek Plates; Mantles and Concaves; Pulverizer Hammers and Liners; Asphalt Mixer Liners and Tips; Manganese Nickel Steel Welding Rod and Plate; Elevator, Conveyor, and Dredge Buckets

Manufacturers Division – National Crushed Stone Association
(continued)

Thew Shovel Co.

East 28th St. and Fulton Rd., Lorain, Ohio

"Lorain" Power Shovels, Cranes, Draglines, Clamshells, Hoes, Scoop Shovels on Crawlers and Rubber-Tire Mountings: Diesel, Electric, and Gasoline, 3/8 to 2-1/2 Yd. Capacities; Thew Moto-Loader—Rubber-Tire Front End Loader 1-3/4 Yd. Capacity

Thor Power Tool Co.

Prudential Plaza, Chicago 1, Ill.

Wagon Drills, Rock Drills, Sump Pumps, Clay Diggers, Paving Breakers, Quarry Bars, Sinker Legs, Drifters, Rock Drilling Jumbos, Raiser Legs, Push Feed Rock Drills, Air and Electric Tools, Accessories, Generator Sets, Power Trowels, Vibratory Screens

Torrington Co.
Bantam Bearings Division

3702 West Sample St., South Bend 21, Ind.

Anti-Friction Bearings; Self-Aligning Spherical, Tapered, Cylindrical, and Needle Roller; Roller Thrust; Ball Bearings

Tractomotive Corp.

County Line Road, Deerfield, Ill.

Rubber Tired Front-End Loaders (Tracto-Loaders)

Traylor Engineering & Mfg. Co.

Allentown, Pa.

Stone Crushing, Gravel, Lime, and Cement Machinery

Trojan Powder Co.

17 North Seventh St., Allentown, Pa.

Explosives and Blasting Supplies

Tyler, W. S., Co.

3615 Superior Ave., N. E., Cleveland 14, Ohio

Woven Wire Screens; Ty-Rock, Tyler-Niagara and Ty-Rocket (Mechanically Vibrated) Screens; Hum-mer Electric Screens; Ro-Tap Testing Sieve Shakers, Tyler Standard Screen Scale Sieves, U. S. Sieve Series

Universal Engineering Corp.
Subsidiary of Pettibone Mulliken Corp.

625 C Ave., N. W., Cedar Rapids, Iowa

Jaw Crushers, Roll Crushers, TwinDual Roll Crushers, Hammermills, Impact Breakers, Pulverizers, Bins, Conveyors, Feeders, Screens, Scrubbers. Bulldog Non-Clog Moving Breaker Plate and Stationary Breaker Plate Hammermills, Center Feed Hammermills. A Complete Line of Stationary and Portable Crushing, Screening, Washing, and Loading Equipment for Rock, Gravel, Sand, and Ore. Aglime Plants. Asphalt Plants

Vibration Measurement Engineers

725 Oakton St., Evanston, Ill.

Seismographic and Airblast Measurements, Seismological Engineering, Blasting Complaint Investigations, Expert Testimony in Blasting Litigation; Nation-wide Coverage; A Complete Seismograph Rental and Record Analysis Service With "Seismolog"

Werco Steel Co.

2151 East 83rd St., Chicago 17, Ill.

Castings—Manganese, Alloy Steel; Screen Plates—Perforated Steel Screen Sections and Decks; Buckets; Chains; Belt Conveyors, Idlers; Dipper—Shovel; Drop Balls; Wire Cloth; Wire Rope and Related Products; Crushers, Pulverizers

Western-Knapp Engineering Co.

50 Church St., New York 7, N. Y.

Plant Design and Construction; Operating Studies; Appraisals

White Motor Co.

842 East 79th St., Cleveland 1, Ohio

On- and Off-Highway Trucks and Tractors—Gasoline- and Diesel-Powered; Industrial Engines—Gasoline and Diesel; Power Units, Axles, Special Machine Assemblies; Crane and Shovel Carriers; Power Generating and Distributing Systems; Batteries; All Classes of Maintenance and Repair Service

White Motor Co.
Autocar Division

Exton, Pa.

Motor Trucks

Wickwire Spencer Steel Division
Colorado Fuel and Iron Corp.

575 Madison Ave., New York 22, N. Y.

Wire Cloth, Screen Sections, Screen Plate—Perforated Steel, Wire Rope—Slings

Williams Patent Crusher & Pulverizer Co.

2701-2723 North Broadway, St. Louis 6, Mo.

Hammer Mills, Crushers, Pulverizers, Roller Mills, Reversible Impactors, Vibrating Screens, Air Separators, Bins, and Feeders

Congratulations to the Winners of the NCSA Safety Contest

The National Crushed Stone Association wishes to extend its heartiest congratulations to the winners of the NCSA Safety Contest.

The crushed stone industry can well take pride in the accomplishments of the 45 plants which operated 3,282,875 man hours during 1957 without a loss time accident.

Appropriate awards will be presented at the NCSA Annual Convention to be held January 27-30, 1959 at the Americana Hotel in Miami Beach, Florida.

The value of the Safety Contest is measured to a large degree by the number of participants. It is not too late to enter your company's plants in the 1958 contest. Full details may be obtained by contacting the Branch of Accident Analysis, Division of Safety, U. S. Bureau of Mines, Washington 25, D. C.